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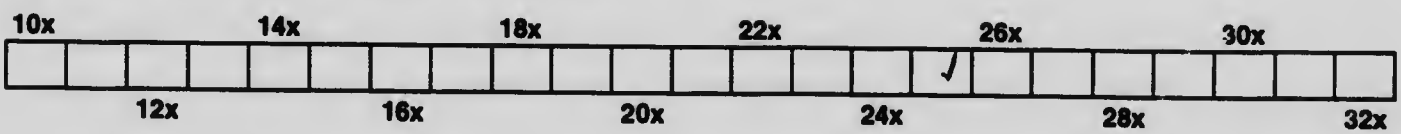

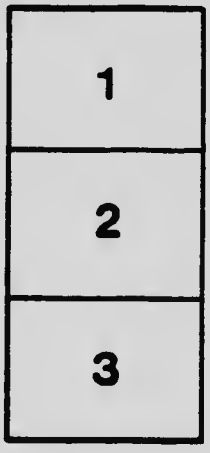

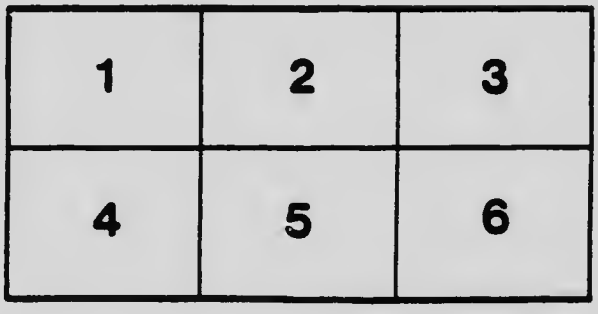

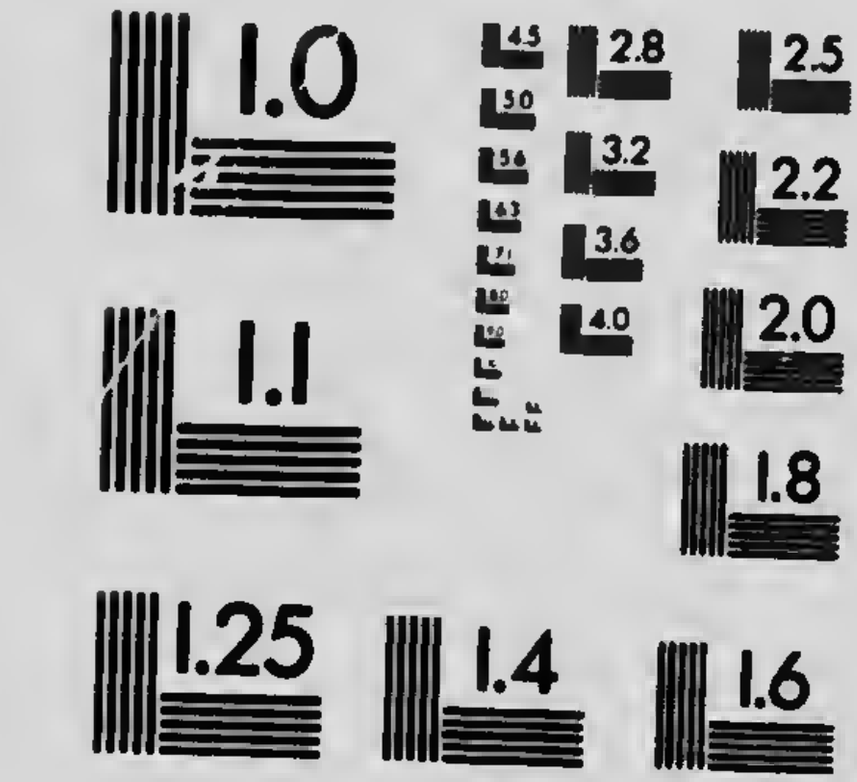

CANADA

DEPARTMENT OF MINES

HON. LOUIS CODERRE, MINISTER; A. P. LOW, LL.D., DEPUTY MINISTER;

MINES BRANCH

EUGENE HAANEL, PH.D., DIRECTOR.

THE

PRODUCTION OF COPPER, GOLD, LEAD, NICKEL, SILVER, ZINC, AND OTHER METALS

IN

CANADA

During the Calendar Year

1912

BY

COSMO T. CARTWRIGHT, B.Sc.

Assistant Mining Engineer, Division of Mineral Resources and Statistics.

OTTAWA

GOVERNMENT PRINTING BUREAU

1913

No. 256.

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No. 256.

CONTENTS.

COPPER.

The total production of copper in Canada in 1912, estimated on a basis of smelter recovery from ores treated, was 77,832,427 pounds, which, at the average price of copper for the year in New York, 16·311 cents per pound, would be worth $12,718,548.

Compiled on a similar basis, the copper production of 1911 was estimated at 55,648,911 pounds, showing a large increase in production in 1912. The average New York price for copper in 1911 was 12·376 cents, the increase in price being 3·935 cents, or 32·0 per cent.

In the Province of British Columbia, the copper production is mainly derived from ores carrying a very low content of the metal. In the smelting of these ores the copper losses in the smelting are quite considerable, reaching as high, in some cases, as 25 per cent or more of the copper content of the ore. With ores of this character there is, therefore, a wide difference between the copper content of the ore shipped from the mine and the copper metal recovered by the smelters.

The statistics of copper production for the years previous to 1909, as given in Table 2, include, for British Columbia, a record of the copper production in that Province as collected by the provincial Bureau of Mines. These are compiled on the basis[1] of the total metal content of the ores sent to smelters for which smelter returns were received during the year, and show a relatively higher copper production than the figures published for the Province of Ontario, which are based on copper content of matte produced.

The independent collection of statistics of smelter production by the Mines Branch—through the courtesy of the smelter operators—has made possible the compilation and publication of statistics of production based on smelter recoveries, as given above; thus providing for a more equitable comparison of the production of the several provinces, and the production of Canada generally with other countries.

[1] The present method of compilation of statistics of copper production by the Provincial Bureau of Mines in British Columbia provides for a deduction of five pounds of copper per ton of ore shipped on account of smelter losses, a method which gives a result closely approximating that obtained by this Branch.

COPPER.—TABLE I.

Production by Provinces 1910, 1911, and 1912.

Provinces.	1910.		1911.		1912.	
	Lbs.	Value.	Lbs.	Value	Lbs.	Value.
		$		$		$
Quebec	877,347	111,757	2,436,190	301,503	3,282,210	526,346
Ontario	19,259,016	2,453,213	17,932,263	2,219,297	22,250,601	3,635,971
British Columbia	35,270,006	4,492,693	35,279,558	4,366,198	50,526,656	8,256,561
Other districts*	286,000	36,431	‡	.....	1,772,660	289,670
Total	55,692,369	7,094,094	55,648,011	6,886,998	77,832,127	12,718,548

* Includes Nova Scotia and Yukon. ‡ A shipment is reported from New Brunswick

With the exception of a small output of copper sulphate at Trail, B.C., the copper production of Canada is practically all exported for refining. The exports of copper in ore, matte, regulus, etc., from Canada during the calendar year 1912 are reported by the Customs Department as 78,488,564 pounds, of which 73,176,744 pounds were exported to the United States, and 5,275,820 pounds to Great Britain.

The exports in 1911 were recorded as 55,287,710 pounds. These figures agree fairly closely with the statistics of smelter recovery.

Prices.—The monthly average prices in cents per pound of electrolytic copper in New York are shown for a period of five years in the accompanying table:—

Monthly Average Prices of Electrolytic Copper in New York.

Months.	1908.	1909.	1910.	1911.	1912.
	Cts.	Cts.	Cts.	Cts.	Cts.
January	13·726	13·893	13·620	12·295	14·094
February	12·905	12·949	13·332	12·256	14·084
March	12·704	12·387	13·255	12·139	14·698
April	12·743	12·563	12·733	12·019	15·741
May	12·598	12·893	12·550	11·989	16·031
June	12·675	13·214	12·404	12·385	17·234
July	12·702	12·880	12·215	12·463	17·190
August	13·462	13·007	12·490	12·405	17·498
September	13·388	12·870	12·379	12·201	17·508
October	13·354	12·700	12·553	12·189	17·314
November	14·130	13·125	12·742	12·616	17·326
December	14·111	13·298	12·581	13·552	17·376
Yearly average	13·208	12·982	12·738	12·376	16·341

In London, the monthly average prices of standard copper were, as shown hereunder, in pounds sterling, per ton of 2,240 pounds:—

Monthly Average Prices of Standard Copper in London.

Months.	1908.	1909.	1910.	1911.	1912.
	£	£	£	£	£
January	62·386	57·688	60·923	55·604	62·760
February	58·786	61·197	59·388	54·970	62·893
March	58·761	56·231	59·214	54·704	65·884
April	58·331	57·363	57·238	54·035	70·294
May	57·387	59·338	56·313	54·313	72·352
June	57·842	59·627	55·310	56·368	78·259
July	57·989	58·556	54·194	56·670	76·636
August	60·500	59·393	55·733	56·264	78·670
September	60·338	59·021	55·207	55·253	78·762
October	60·139	57·551	56·722	55·176	76·389
November	63·417	58·917	57·634	57·253	76·890
December	62·943	59·906	56·069	62·063	75·516
Yearly average	59·902	58·732	57·054	55·973	72·942

The price of copper in New York varied between 13·75 cents per pound in February and a maximum of 17·60 cents per pound in August.

Statistics showing the annual copper production of Canada since 1886 are given in Table 2, which shows the yearly increase or decrease as the case may be, and also the yearly price per pound in New York.

COPPER.—TABLE 2.

Annual Production.

Calendar Year.	Lbs.	Increase or decrease.		Value.	Increase or decrease.		Average price per pound.
		Lbs.	%		$	%	
				$			Cts.
1886	3,505,000			385,550			11·00
1887	3,260,424	(d) 244,576	6·99	366,798	(d) 18,752	4·86	11·25
1888	5,562,864	2,302,440	70·60	927,107	560,309	152·70	16·66
1889	6,809,752	1,246,888	22·40	936,341	9,234	0·99	13·75
1890	6,013,671	(d) 796,081	11·69	947,153	10,812	1·15	15·75
1891	9,529,401	3,515,730	58·46	1,226,703	279,550	29·51	12·87
1892	7,087,275	2,442,126	25·63	818,580	(d) 408,123	33·27	11·55
1893	8,109,856	1,022,381	14·40	871,809	53,229	6·50	10·75
1894	7,708,789	(d) 401,067	4·94	736,960	(d) 134,849	15·46	9·56
1895	7,771,639	62,850	0·81	836,228	99,268	13·47	10·76
1896	9,393,012	1,621,373	20·86	1,021,960	185,732	22·21	10·88
1897	13,300,802	3,907,790	41·60	1,501,660	479,700	46·94	11·29
1898	17,747,136	4,446,334	33·43	2,134,980	633,320	42·17	12·03
1899	15,078,475	(d) 2,668,661	15·04	2,655,319	520,339	24·37	17·61
1900	18,937,138	3,858,663	25·59	3,065,922	410,603	15·46	16 19
1901	37,827,019	18,889,881	99·75	6,096,581	3,030,659	98·84	16·117
1902	38,804,259	977,240	2·58	4,511,383	(d) 1,585,198	26·00	11·626
1903	42,684,454	3,880,195	10·00	5,649,487	1,138,104	25·23	13 235
1904	41,383,722	(d) 1,300,732	3·05	5,306,635	(d) 342,852	6·07	12·823
1905	48,092,753	6,709,031	16·21	7,497,660	2,191,025	41·29	15·590
1906	55,609,888	7,517,135	15·63	10,720,474	3,222,814	42·98	19·278
1907	56,979,205	1,369,317	2·46	11,398,120	677,654	6·32	20·004
1908	63,702,873	6,723,668	11·80	8,413,876	2,984,244	26·18	13 208
1909*	52,493,863			6,814,754			12·982
1910	55,692,369	3,198,506	6·09	7,094,094	279,340	4·10	12·738
1911	55,648,011	(d) 44,358	0·79	6,886,998	(d) 207,096	2·92	12·376
1912	77,832,127	22,184,116	28·50	12,718,548	5,831,550	45·85	16·341

* The decrease is not as large as the figures would indicate because of the calculation of part of the 1909 production on a different basis from previous years. (See explanation in text).

Statistics of the exports of copper, as collected by the Customs Department, are shown in Table 3, and statistics of imports in Tables 4 and 5. The total imports of copper, in so far as weights are given, amounted, during the fiscal year ending March, 1912, to 36,656,429 pounds. During the calendar year 1912 the total imports were valued at $7,047,356, and included crude and manufactured copper to the extent of 42,832,747 pounds, valued at $6,741,895, together with other copper manufactures valued at $305,461, of which the quantity is not stated. In detail, these imports comprise: copper (pigs, ingots, scrap, blocks, etc.), 7,634,539 pounds, valued at $823,374; copper in bars, rods, coils, etc., 29,520,400 pounds, valued at $4,665,791; copper in strips, sheets, or plates, 4,462,400 pounds, valued at $841,207; copper tubing, etc., 770,576 pounds, valued at $167,257; and copper wire, 444,832 pounds, valued at $101,748.

COPPER.—TABLE 3.

Exports of Copper in Ore, Matte, etc.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1885		262,900	1899	11,371,766	1,199,908
1886		249,259	1900	23,631,523	1,741,885
1887		137,966	1901	32,488,872	3,404,908
1888		257,260	1902	26,094,498	2,476,516
1889		168,457	1903	38,364,676	3,873,827
1890		398,497	1904	38,553,282	4,216,214
1891		348,104	1905	40,740,861	5,443,873
1892		277,632	1906	42,398,538	7,303,366
1893	4,792,201	269,160	1907	54,688,450	8,749,609
1894	1,625,389	91,917	1908	51,136,371	5,934,559
1895	3,742,352	236,965	1909	54,447,750	5,832,246
1896	5,462,652	281,070	1910	56,964,127	5,840,553
1897	14,022,610	850,336	1911	55,287,710	5,467,725
1898	11,572,381	840,243	1912	78,488,564	9,036,479

COPPER.—TABLE 4.

Imports of Pigs, Old, Scrap, etc.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	31,900	2,130	1897	49,000	5,449
1881	9,800	1,157	1898	1,050,000	80,000
1882	20,200	1,984	1899	1,655,000	246,740
1883	124,500	20,273	1900	1,144,000	180,990
1884	40,200	3,180	1901	951,500	152,274
1885	28,600	2,016	1902	1,767,200	325,832
1886	82,000	6,969	1903	2,038,400	252,594
1887	40,100	2,507	1904	2,115,300	270,315
1888	32,300	2,322	1905	1,944,400	266,548
1889	32,300	3,288	1906	2,627,700	441,854
1890	112,200	11,521	1907. (9 mos.)	2,616,600	520,971
1891	107,800	10,452	1908	3,612,400	650,597
1892	343,600	14,894	1909	2,732,300	383,441
1893	168,300	16,331	1910	4,690,700	617,630
1894	101,200	7,397	1911	5,023,700	641,749
1895	72,062	6,770	1912	5,542,000	699,442
1896	86,905	9,226			

			Lbs.	Value.
1912	Copper, old and scrap or in blocks	Duty free.	192,300	21,926
	Copper in pigs or ingots	Duty free.	5,349,700	677,516
	Total		5,542,000	699,442

COPPER.—TABLE 5.

Imports of Manufactures.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	123,061	1891	563,522	1902	1,281,522
1881	159,163	1892	422,870	1903	1,291,635
1882	220,235	1893	458,715	1904	1,191,610
1883	247,141	1894	175,404	1905	1,775,881
1884	134,534	1895	251,615	1906	2,660,303
1885	181,469	1896	285,220	1907 (9 mos.)	2,545,600
1886	219,420	1897	264,587	1908	2,713,060
1887	325,365	1898	786,529	1909	2,086,205
1888	303,459	1899	551,586	1910	2,870,630
1889	402,216	1900	1,090,280	1911	3,742,940
1890	472,668	1901	551,045	1912	4,494,723

		Duty.	Lbs.	Value.
				$
1912	Copper in bars and rods, in coils, or otherwise, in lengths not less than 6 feet, unmanufactured	Free.	26,925,300	3,558,502
	Copper, in strips, sheets or plates, not planished or coated, etc.	"	3,220,500	505,769
	Copper tubing in lengths not less than 6 feet, and not polished, bent or otherwise manufactured	"	573,328	115,323
	Copper rollers, for use in calico printing	"		14,233
	Copper and manufactures of:—			
	Nails, tacks, rivets and burrs or washers	30 %		2,294
	Wire, plain, tinned or plated	15 "	395,301	76,635
	Wire cloth, etc.	25 "		10,960
	All other manufactures of, N.O.P.	30 "		211,007
	Total			4,494,723

Nova Scotia.

A certain amount of prospecting was carried on during the year, but no mining of copper ores is reported.

New Brunswick.

No shipments were made from this Province in 1912.

Quebec.

In the Province of Quebec there was greatly increased activity during the year, the producing mines of the Eastern Townships shipping an increased tonnage of pyritic ores. The copper production for 1912 was 3,282,210 pounds, valued at $536,346, representing the estimated recovery from 60,849 tons of ore and concentrates.

Statistics of the copper production of this Province since 1886 are shown in Table 6.

COPPER.—TABLE 6.

Quebec:—Production.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1886	3,340,000	367,400	1900	2,220,000	359,418
1887	2,937,900	330,514	1901	1,527,442	246,178
1888	5,562,864	927,107	1902	1,640,000	190,666
1889	5,315,000	730,813	1903	1,152,000	152,467
1890	4,710,606	741,920	1904	1,760,000	97,455
1891	5,401,704	695,469	1905	621,243	252,752
1892	4,883,480	564,042	1906	1,981,169	381,930
1893	4,468,352	480,348	1907	1,517,990	303,659
1894	2,176,430	208,067	1908	1,282,024	169,330
1895	2,242,462	241,288	1909	1,088,212	141,272
1896	2,407,200	261,903	1910	877,347	111,757
1897	2,474,970	279,424	1911	2,436,190	301,503
1898	2,100,235	252,658	1912	3,282,210	536,346
1899	1,632,560	287,494			

Ontario.

The copper production of Ontario comes almost entirely from the nickel-copper ores of the Sudbury district, and the copper may be regarded as a by-product of these ores.

The chief producing companies in 1912 were the Canadian Copper Company, at the Creighton and Crean Hill mines, and the Mond Nickel Company, at the Victoria and Garson mines. During the year the Alexo mine near Kelso Mines, Ontario, shipped a good tonnage of nickel-copper ore to the Mond Nickel Company's smelter at Victoria Mines, and a few small shipments

of copper ore were made from Dane, on the Timiskaming and Northern Ontario railway, to United States smelters.

The total tonnage of nickel-copper ores smelted in 1912 was 725,065 tons. There were produced during the year 41,925 tons of Bessemer matte, containing 11,116 tons of copper and 22,421 tons of nickel, the shipping value of the matte being approximately $6,303,102. Details of the production of these ores are given more completely and in tabular form in the article on nickel, and also under smelter production.

It is of interest to note that a small amount of copper was paid for by American smelters in a few shipments of Cobalt ores.

The Ontario Government offers a bounty on copper over 95 per cent pure metal, and on copper-sulphate produced from ore mined and refined in the Province. The text of the Act will be found in the chapter on cobalt, under the heading 'Metal Refining Bounty Act.'

Statistics of the copper production of Ontario since 1886 are given in the table following:—

COPPER.—TABLE 7.

Ontario:—Production.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1886	165,000	18,150	1900	6,740,058	1,091,215
1887	322,594	36,284	1901	8,695,831	1,401,507
1888	Nil.	Nil.	1902	7,408,202	861,278
1889	1,466,752	201,678	1903	7,172,533	949,285
1890	1,303,065	205,233	1904	4,913,594	630,070
1891	4,127,697	551,234	1905	8,779,259	1,368,686
1892	2,203,795	254,538	1906	10,638,231	2,050,838
1893	3,641,504	391,461	1907	14,104,337	2,821,432
1894	5,207,679	497,854	1908	15,005,171	1,981,883
1895	4,576,337	492,414	1909	15,746,699	2,044,237
1896	3,167,256	344,598	1910	19,259,016	2,453,213
1897	5,500,652	621,023	1911	17,932,263	2,219,297
1898	8,375,223	1,007,539	1912	22,250,601	3,635,971
1899	5,723,324	1,007,877			

British Columbia.

According to returns received from the smelters, the total quantity of copper contained in matte, blister, and copper-sulphate produced in British Columbia smelters during 1912, and including an estimate of smelter recovery for the copper ores exported, was 50,526,656 pounds, after deducting the amount of copper produced from foreign ores. The production in 1911, on a similar basis, was 35,279,558 pounds, and in 1910, 35,270,006 pounds. Returns of smelter production in this Province were not collected by this Department previous to 1908, and a complete record of statistics of production on this basis is not available.

The production of copper in this Province, according to statistics collected and published by the provincial Department of Mines, reached a total of 51,456,537 pounds in 1912, as compared with 36,927,656 pounds in 1911. Statistics of the annual production since 1894, as ascertained by the provincial Department of Mines, are shown in Table 8, and by districts since 1907, in Table 9.

According to direct returns in 1912, the ores of the Boundary district produced about 65.8 per cent of the total, the Rossland mines about 4.1 per cent, and the Coast district 30.1 per cent.

COPPER.—TABLE 8.

British Columbia:—Copper Content of Ores Shipped.†

Calendar Year.	Copper contained in ores, shipped.	Increase.		Value.
	Lbs.	Lbs.	%	
1894				$
1895	324,680			
1896	952,840	628,160	193·00	31,039
1897	3,818,556	2,865,716	301·00	102,526
1898	5,325,180	1,506,624	39·00	415,459
1899	7,271,678	1,946,498	36·00	601,213
1900	7,722,591	450,913	6·00	874,783
1901	9,977,080	2,254,489	29·00	1,359,948
1902	27,603,746	17,626,666	177·00	1,615,289
1903	29,636,057	2,032,311	7·00	4,448,896
1904	34,359,921	4,723,864	16·00	3,445,488
1905	35,710,128	1,350,207	3·7	4,547,735
1906	37,692,251	1,982,123	5·6	4,579,110
1907	42,990,488	5,298,237	14·1	5,876,222
1908	40,832,720	*2,157,768	*5·02	8,287,706
1909	47,274,614	6,441,894	15·8	8,168,177
1910‡	45,597,245	*1,677,369	*3·6	6,244,031
1911‡	38,243,934			5,918,522
1912‡	36,927,656	*1,316,278	*3·4	4,871,512
	51,546,537	14,618,881	39·6	4,572,644
				8,408,513

* Decrease. † As published by British Columbia Bureau of Mines. ‡ Allowing 5 pounds copper per ton of ore for smelter losses.

COPPER.—TABLE 9.

British Columbia:—Production* by Districts.

——	1907.	1908.	1909.	1910.†	1911.†	1912.†
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Cassiar	674,887	490,873	137,651	....	19,151	88,403
West Kootenay—						
Nelson	434,222	53,243	186,572	231,936	.....	26,257
Trail creek	5,080,275	5,042,244	3,509,909	3,577,745	3,429,702	2,539,900
Yale—						
Boundary	31,521,550	40,178,521	40,603,042	31,354,985	22,327,359	33,372,199
Ashcroft }						
Kamloops }	38,706	3,269	....	1,178	152,723	....
Coast districts	3,083,080	1,506,464	1,160,071	3,078,090	10,998,721	15,429,778
Total	40,832,720	47,274,614	45,597,245	38,243,934	36,927,656	51,456,537

* Copper content of ores shipped. † After deducting five pounds of copper per ton of ore for slag losses.

In the Boundary district practically all the production is from the mines of three of the large smelting companies: the Granby Consolidated Mining, Smelting, and Power Company, Limited; the British Columbia Copper Company, Limited; and the New Dominion Copper Company, Limited. The last named is controlled by the British Columbia Copper Company. The two companies first named operated their own smelters, converting their matte into blister copper. The Consolidated Mining and Smelting Company of Canada, Limited, did not ship from any of their properties in this district during the year. The low grade ores of this district are self-fluxing and remarkably uniform in character, ranging from 1 to 2 per cent in copper, and from $1 to $2 in gold and silver.

The approximate ore shipments during 1912, and the total shipments of the chief producers from mines in this district to the end of 1912, were as follows:—

——	1912.	Total.
	Tons.	Tons.
Granby Consolidated Mining, Smelting, and Power Co., Ltd	1,250,000	8,666,570
British Columbia Copper Co., Ltd	400,000	3,152,475
New Dominion Copper Co., Ltd	262,000	1,093,697
Consolidated Mining and Smelting Co., of Canada, Ltd		613,000

The chief producing mines of the district were the Granby mines; the Mother Lode, Emma, Wellington, and Jack Pot Fraction, of the British Columbia Copper Company; and the Rawhide and Athelstan, of the New Dominion Copper Company.

Next in importance in point of production came the Coast district, with heavy shipments from the Britannia mines on Howe sound and the Marble Bay mines on Texada island. Several smaller properties also shipped.

The Rossland district is also an important source of the copper production of the Province, though its ores are chiefly valuable for their gold content.

Interest in development work was directed to several points during the year: the acquirement of the Eureka and Queen Victoria groups in the Nelson district by the British Columbia Copper Company, and of the Silver King by the Consolidated Mining and Smelting Company; the developments being carried on in the Similkameen by the Granby and British Columbia companies, and the development of the Hidden Creek Copper mines and erection of a smelter at Anyox by the Granby Consolidated Mining, Smelting, and Power Company. The copper properties at Roeher de Boule mountain, near Hazelton, in northern British Columbia, indicate a probable source of further supplies of the metal with the development of transportation facilities.

Yukon.

In the Yukon district heavy shipments of copper ore were made during 1912 from Whitehorse. The Whitehorse copper belt was discovered in 1897, and the first claim was staked the following year. Shipments were made at different times from the various properties. The cost of transportation retarded development, so that the lowering of freight rates in the earlier part of 1912 by the White Pass and Yukon railway has been an important factor in this year's production. The chief shipper is the Pueblo mine, operated by the Atlas Mining Company, of Whitehorse.

GOLD.

Refined Metal.—The Dominion Assay Office in Vancouver, operated in connexion with this Department, receives, assays, and purchases crude gold bullion, amalgam, nuggets, and dust, the resultant bullion being resold. The total quantity of bullion thus received during the twelve months ending December 31, 1912, was 57,951·98 ounces, being the weight after melting, valued at $974,077.14, after deducting office charges.

The assay charge was removed January, 1913, leaving the melting charge, equivalent to one-eighth of one per cent of the value of the bullion, thus placing the charges on a par with those of American offices.

A refinery has been erected at the Royal Mint, at Ottawa, and shipments of gold have been received from different provinces.

There is but one other refinery in Canada producing fine gold, that at Trail, established in 1904, operated by the Consolidated Mining and Smelting Company of Canada, Limited, the annual output of which is given below. The gold is recovered from the ores treated in the lead furnaces.

Production of Refined Gold at Trail, B.C.

Year.	Ozs.
1904	4,336
1905	8,602
1906	9,993
1907	10,395
1908	15,346
1909	18,241
1910	13,298
1911	15,270
1912	12,118

Mine Production.—The production of gold in Canada—made up of gold derived from alluvial workings, gold obtained from the crushing of free-milling quartz ores, and the gold obtained from ores and concentrates sent to copper and lead smelters, etc.—reached a total, in 1912, of 611,885 fine ounces, valued at $12,648,794, as compared with 473,159 fine ounces, valued at $9,781,077, in 1911, an increase of 138,726 ounces in quantity and $2,867,717 in value, or 29·32 per cent.

The production, by provinces, in 1910, 1911, and 1912 is shown in Table 1, as follows:—

GOLD.—TABLE 1.

Production by Provinces, 1910, 1911, and 1912.

	1910.		1911.		1912.	
	Ozs.(fine ‡)	Value.	Ozs.(fine ‡)	Value	Ozs. (fine ‡)	Valu
		$		$		$
Nova Scotia	7,928	163,891	7,781	160,854	4,385	90,6
Quebec	124	2,565	613	12,672	642	13,2
Ontario	3,089	63,849	2,092	42,625	86,523	1,788,5
Alberta	89	1,850	10	207	73	1,5
British Columbia	261,386	5,403,318	238,496	4,930,145	251,815	5,205,4
Yukon	221,091	4,570,362	224,197	4,634,574	268,447	5,549,2
Total	493,707	10,205,835	473,159	9,781,077	611,885	12,648,7

‡ Calculated from the value: one dollar = 0·048375 ozs.

	1910.	1911.	1912.
	$	$	$
(a) As follows: Gold from placer mining	540,000	426,000	555,500
Gold from vein mining	4,863,318	4,504,145	4,649,985
	5,403,318	4,930,145	5,205,485

The exact value of fine gold is $\frac{20.67}{427}$ dollars per ounce equivalent to $20.671834. (United States Standard.)

In most cases, statistics of gold production are stated as crude bullion with value thereof. The fine ounces given in the tables in this report are calculated from the values by multiplying these by $\frac{20.67}{427}$ or 0·048375.

Of the total production in 1912, about $6,106,677, or 48·3 per cent, is to be attributed to alluvial workings, $2,270,331, or 17·9 per cent, was derived from stamp milling, and $4,271,786, or 33·8 per cent, obtained from ores sent to the smelters.

There was a general increase in all the provinces except Nova Scotia, the increase from Ontario being most noticeable, due to the mines of Porcupine reaching a producing stage.

Statistics of the annual gold production of Canada are shown in Table 2:—

GOLD. TABLE 2.

Annual Production in Canada, 1858-1912.

Calendar Year.	Ozs. (fine)[1]	Value.	Calendar Year.	Ozs. (fine)[1]	Value.
		$			$
1858.	34,104	705,000	1886	70,782	1,463,496
1859.	78,121	1,615,072	1887	57,460	1,187,804
1860.	107,806	2,228,543	1888	53,145	1,098,610
1861.	128,073	2,646,118	1889	62,653	1,295,129
1862.	135,391	2,798,774	1890	55,620	1,149,776
1863.	202,498	4,186,041	1891	45,018	930,614
1864.	199,695	4,126,199	1892	43,905	907,501
1865.	192,898	3,987,562	1893	47,243	976,603
1866.	152,555	3,154,507	1894	54,600	1,128,688
1867.	145,775	3,013,431	1895	100,798	2,083,674
1868.	134,169	2,773,527	1896	133,262	2,754,774
1869.	102,720	2,123,405	1897	291,557	6,027,015
1870.	83,415	1,724,348	1898	666,386	13,775,420
1871.	105,187	2,174,412	1899	1,028,520	21,261,584
1872.	90,283	1,866,321	1900	1,350,057	27,908,153
1873.	71,346	1,536,871	1901	1,167,216	24,128,563
1874.	97,856	2,022,862	1902	1,032,161	21,339,067
1875.	130,300	2,693,533	1903	911,559	18,843,580
1876.	97,729	2,020,233	1904	796,374	16,462,517
1877.	94,304	1,949,444	1905	684,951	14,159,195
1878.	74,420	1,538,384	1906	556,415	11,502,170
1879.	76,547	1,582,358	1907	405,517	8,382,780
1880.	63,121	1,304,824	1908	476,112	9,842,305
1881	63,524	1,313,153	1909	456,865	9,382,230
1882.	60,288	1,246,268	1910	493,707	10,205,845
1883.	53,853	1,113,246	1911	473,159	9,781,077
1884.	51,262	1,058,439	1912	611,885	12,648,794
1885	55,57-	1,148,823			
				15,010,503	310,294,859

[1] Calculated from the value; one dollar = 0.048375.

Gold was discovered in various provinces of Canada about 1858, and it will be observed that the production gradually increased to a maximum in 1863, and then more or less regularly decreased to a minimum in 1892, then, increasing with further discoveries, it received the impetus of the discovery of the Yukon in 1896 and rose to over twenty-seven million dollars in 1900, and again fell with the exhaustion of the smaller placer holdings; 1909 saw another low point, but the increasing production from Porcupine district, Ontario, and from other provinces also, promises well for the future.

Nova Scotia.

The gold production of Nova Scotia, which is derived almost entirely from quartz ores, was 4,385 fine ounces, valued at $90,638. The Deputy Inspector of Mines for the Province, states in his report for the fiscal year 1912: 'The gold production is the lowest since gold mining was established as an industry in the Province and, it is almost needless to say, is disappointing. It is, however, but justice to the industry to say that it does not fairly represent the operations carried on, as at several of the districts the principal efforts of the operators

were directed to mine development and prospecting rather than to the i
diate recovery of gold.'

The principal operators in 1912 were:—

Byrea Bower, Carleton.
M. J. O'Brien and tributors, Caribou.
Stillwater Mining Co., Moose River.
Switzer Mining Co., Fifteenmile brook.
Unique Mines and Power Co., Gold River.
W. A. Brennan and tributors, Oldham.
M. J. O'Brien, *et al.*, Renfrew.
New England Mining Co., Stormont.
Sydney Gold Mining Co., Stormont.
Seal Harbour Mining Co., Stormont.
Boston and Goldenville Mining Co., Shier point.
Goldenville Mining Co., Sherbrooke.
Dominion Leasing Co., Tangier.
Gladwin Gold Mining Co., Beaver Dam.
S. R. Giffin & Sons, Stormont.
Petpeswick Mining Co., Lake Catcha.

Statistics of the annual production since 1862 are shown in Table 3, a
the production of gold by districts during the twelve months ending Septem
30, 1912, as collected and published by the provincial Mines Department,
Table 4, while the total production from 1862 to 1911, by districts, accordi
to the same authority, is shown in Table 5.

GOLD.—TABLE 3.

Nova Scotia:—Annual Production.

Cal. Year.	Tons treated.	Ozs. (fine).	Value.	Yield of gold per ton.	Cal. Year.	Tons treated.	Ozs. (fine).	Value.	Yield of gold per ton
			$	$				$	$
1862..	6,473	6,863	141,871	21·91	1888..	36,178	21,137	436,939	12·08
1863..	17,000	13,189	272,448	16·02	1889..	39,160	24,673	510,029	13·02
1864..	21,451	18,883	390,349	18·21	1890..	42,749	22,978	474,980	11·11
1865..	24,421	24,011	496,357	20·32	1891..	36,351	21,841	451,503	12·42
1866..	32,157	23,776	491,491	15·28	1892..	32,552	18,865	389,985	11·98
1867..	31,394	25,763	532,563	16·91	1893..	42,354	18,436	381,095	8·99
1868..	32,259	19,377	400,555	12·41	1894..	55 37	18,834	389,338	7·04
1869..	35,144	16,855	348,427	19·91	1895..	60,. 80	21,919	453,119	7·47
1870..	36,824	18,740	387,392	12·56	1896..	69,160	23,876	493,588	7 13
1871..	30,787	18,130	374,972	12·17	1897..	73,192	27,195	562,165	7·68
1872..	17,089	12,352	255,349	14·94	1898..	82,747	26,054	538,590	6·50
1873..	17,708	11,180	231,122	13·05	1899..	112,226	29,876	617,604	5·50
1874..	13,844	8,623	178,241	12·87	1900..	87,380	28,055	598,553	6·85
1875..	14,8[illegible]	10,576	218,629	14·76	1901..	91,948	26,459	546,983	5·32
1876..	15,490	11,300	233,585	15·08	1902..	93,042	30,348	627,357	6·68
1877..	17,369	15,925	329,205	18·95	1903..	103,856	25,533	527,806	5·08
1878..	17,989	11,864	245,253	13·61	1904..	45,436	10,362	214,209	4·71
1879..	15,936	12,980	268,328	16·83	1905..	57,771	13,707	283,353	4·90
1880..	13,997	12,472	257,821	18·42	1906..	66,069	12,223	252,676	3·82
1881..	16,556	10,147	209,755	12·66	1907	58,550	13,675	282,686	4·82
1882 .	21,081	13,307	275,090	13·04	1908..	61,536	11,842	244,790	3·97
1883.	25,954	14,571	801,207	11·60	1909..	56,790	10,193	210,713	3·71
1884..	26,186	15,168	313,554	12·44	1910..	43,006	7,928	163,891	3·81
1885 .	28,890	20,945	432,971	14·98	1911..	18,328	7,781	160,854	8·78
1886.	29,019	22,038	455,564	15·70	1912.	14,360	4,385	90,638	6·31
1887..	32,280	20,009	413,631	12.81					

Total fine ounces gold. 888,122
Total value. $18,359,136

GOLD.—TABLE 4.

Nova Scotia:—District Details, Year Ending September 30, 1912.

District.	Tons crushed.	Total yield of gold.			Average yield of gold per ton.		
		oz.	dwt.	grs.	oz.	dwt.	grs.
Beaver Dam	99	59	10	0	.....	12	0
Carleton.....	10	1	0	0	.....	2	0
Caribou.....	1,367	984	14	0	.....	14	10
Caribou (Moose River) . . .	1,033	330	5	13	.....	6	32
Fifteenmile brook.....	225	21	1	5	.....	1	21
Gold River.....	36	27	3	0	.....	15	2
Harrigan Cove.....	Mortared	2	10	0	.....	.....	
Lake Catcha	1,572	161	19	2	.....	2	1
Lawrencetown.....	Mortared	1	17	0	.....	.....	
Oldham	314	127	5	0	.....	8	3
Pleasant River Barrens.. ...	30	12	0	0	.....	8	0
Renfrew	2,908	1,182	11	0	.....	8	3
Shier point.....	171	69	10	0	.....	8	3
Stormont.....	4,263	806	3	0	.....	3	19
Tangier.....	3,859	1,161	9	0	.....	6	1
Uniacke.....	10	.....	2	0	.....	.....	5
Totals	15,868	4,948	19	20	.....	6	5

GOLD.—TABLE 5.

Nova Scotia:—Production of Gold from 1862 to 1912.

District.	Tons crushed.	Total yield of gold.			Average yield of gold per ton.			Value at $ per oz.
		oz.	dwt.	grs.	oz.	dwt.	grs.	
*Caribou and Moose River	220,027	60,196	2	19	.....	5	11	
Montagu	29,523	42,173	3	6	1	8	14	11,437
Oldham	58,735	67,343	2	22	1	2	22	8,012
Renfrew	61,319	48,508	8	19	.....	15	20	12,795
Sherbrooke	300,213	153,090	1	4	.....	10	5	9,216
Stormont	525,237	120,549	18	13	....	4	14	29,087
Tangier	64,112	28,230	15	19	.....	8	20	22,904
†Uniacke	63,351	43,983	1	17	.....	13	21	5,363
Waverley	155,520	69,986	10	16	.....	9	0	8,356
Brookfield	93,527	38,709	2	2	.....	8	7	13,296
‡Salmon River	118,819	41,852	5	20	.....	7	1	7,354
††Whiteburn	6,907	9,800	0	2	1	8	12	7,951
Lake Catcha	29,637	27,468	10	9	....	18	13	1,862
¶Rawdon	12,189	9,606	5	10	....	15	18	5,219
Wine Harbour	77,396	34,992	15	11	....	9	1	1,825
**Fifteenmile Stream	36,878	17,363	0	5	.....	9	10	6,648
Malaga Barrens	22,926	20,305	12	6	.....	17	17	3,298
§West Gore (from Stibnite ore)	3,240	4,512	15	10	1	7	20	3,858
Other districts	143,758	74,959	8	19	.....	10	11	857
	2,023,114	913,625	1	13	.	8	19	14,242
								$173,588

* From 1869, † from 1868, ‡ from 1883, ¶ from 1887, †† from 1882, ¶ from 1887, ** from 1883, § from 1905.

Quebec.

The gold of this Province is derived from two sources, the pyritic ores of the Eastern Townships, and the alluvial deposits in Beauce. The pyritic ores are treated primarily for their sulphur and copper contents but carry also small values in gold and silver. The mines at Eustis and Weedon were very active during the year.

GOLD. TABLE 6.

Quebec:—Annual Production.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1877	583	12,057	1896	145	3,000
1878	868	17,937	1897	44	900
1879	1,160	23,972	1898	295	6,089
1880	1,605	33,174	1899	238	4,916
1881	2,741	56,661	1900	Nil.	Nil.
1882	827	17,093	1901	145	3,000
1883	860	17,787	1902	391	8,073
1884	422	8,720	1903	180	3,712
1885	103	2,129	1904	140	2,900
1886	193	3,981	1905	191	3,940
1887	78	1,604	1906	165	3,412
1888	181	3,740	1907	Nil.	Nil.
1889	58	1,207	1908	Nil.	Nil.
1890	65	1,350	1909	193	3,990
1891	87	1,800	1910	124	2,565
1892	628	12,987	1911	613	12,672
1893	759	15,696	1912	642	13,270
1894	1,412	29,106			
1895	62	1,281		16,198	335,432

* Calculated from the value: one dollar = 0·048375 ozs.

Ontario.

The feature of the year from the standpoint of gold production was the commencement of steady milling operations by the mines of Porcupine district, resulting in an increase of nearly one and three-quarter millions of dollars in the provincial production. There was also an increased production from the older gold districts of the Province.

Among the producing mines of the Province in 1912 were:—

Cordova Mines, Ltd., Cordova mine, Peterborough county.

The Dome Mines Co., Ltd., Dome mine, Tisdale township, Nipissing district.

The Hollinger Gold Mines, Ltd., Hollinger mine, Tisdale township, Nipissing district.

The McIntyre Porcupine Mines, Ltd., McIntyre mine, Tisdale township, Nipissing district.

Vipond Porcupine Mines Co., Ltd., Vipond mine, Tisdale township, Nipissing district.

Detroit New Ontario Mines, Ltd., Detroit mine, Munro township.

Clement A. Foster, Tough-Oakes mine, Kirkland lake.

Sturgeon Lake Development Co., St. Anthony mine, Sturgeon lake, Thunder bay.

Elizabeth Gold Mines, Ltd., Elizabeth mine, Steeprock lake, Rainy River district.

Great Golconda Mines, Ltd., Golconda (Laurentian) mine, Gold Rock, Rainy River district.

Olympia Gold Mining Co., Olympia mine, Shoal lake.
Redeemer Mining Co., Redeemer mine, Dryden.

Statistics of the production of gold in Ontario since 1887 are sho
Table 7 following:—

GOLD.—TABLE 7.

Ontario:—Annual Production.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Va
		$			
1887	327	6,760	1901	11,844	24
1888	Nil.	Nil.	1902	11,118	22
1889	Nil.	Nil.	1903	9,076	18
1890	Nil.	Nil.	1904	1,935	40
1891	97	2,000	1905	4,402	91
1892	344	7,118	1906	3,202	66
1893	708	14,637	1907	3,212	66
1894	1,917	39,624	1908	3,212	66
1895	3,015	62,320	1909	1,569	32
1896	5,563	115,000	1910	3,089	63
1897	9,157	189,294	1911	2,062	42
1898	12,863	265,889	1912	86,523	1,788
1899	20,394	421,591		210,040	4,341
1900	14,391	297,495			

*Calculated from the value: one dollar = 0·048375 ozs.

Manitoba.

While there was no production in 1912 from this Province, considera
interest has developed in recent discoveries in the eastern part, and seve
companies have commenced work, and some are expected to reach the prod
ing stage during 1913.

Alberta.

There has been, as in past years, a small production from the placer deposi
of the Saskatchewan river.

Statistics of the production of gold from the Saskatchewan river sinc
1887 are shown in Table 8.

GOLD.—TABLE 8.

Alberta:—Annual Production.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1887	102	2,100	1901	726	15,000
1888	58	1,200	1902	484	10,000
1889	967	20,000	1903	48	1,000
1890	193	4,000	1904	24	500
1891	266	5,500	1905	121	2,500
1892	508	10,506	1906	39	800
1893	466	9,640	1907	33	675
1894	726	15,300	1908	50	1,037
1895	2,419	50,000	1909	25	525
1896	2,661	55,000	1910	89	1,850
1897	2,419	50,000	1911	10	207
1898	1,209	25,000	1912	73	1,509
1899	726	15,000			
1900	242	5,000		14,684	303,549

* Calculated from the value; one dollar = 0·048375 ozs.

British Columbia.

The gold production of British Columbia in 1912, as reported to the Department, amounted to $5,205,485, comprising: placer gold, $555,500; bullion from milling ores, $391,572; and smelter recoveries, $4,258,413. The statistics for lode gold represent, as closely as can be ascertained, the actual gold recovery based on smelter recoveries and bullion shipments.

In alluvial gold recovery a general increase was shown. Of the 1912 production, about 11 per cent was from alluvial workings, 7 per cent from free milling ores, and 82 per cent from ores sent to the smelters.

Statistics of the production by districts, in 1911, as published by the provincial Department of Mines, are shown in Table 9, while the total annual production since 1858 is given in Table 10.

GOLD.—TABLE 9.

British Columbia:—Production by Districts,* 1912.

Districts.	Gold Placer.		Gold Lo	
	Ozs.	Value.	Ozs.	V
		$		
Cariboo:—				
Cariboo	9,000	180,000		
Quesnel	2,500	50,000		
Omineca	400	8,000		
Cassiar:—				
Atlin	14,500	290,000		
All other	450	9,000	197	
East Kootenay:—				
Fort Steele	100	2,000		
West Kootenay:—				
Ainsworth			80	
Nelson	50	1,000	17,513	361
Slocan			198	
Trail creek			132,073	2,729
Others	225	4,500	89	
Lillooet	250	5,000		
Yale:—				
Grand Forks	50	1,000	104,849	2,167
Similkameen	100	2,000		
Yale	100	2,000		
Coast and all others	50	1,000	2,497	51
	27,775	555,500	257,496	5,322

* From Annual Report of the Minister of Mines for British Columbia.

GOLD.—TABLE 10.

British Columbia.—Annual Production.

Calendar Year.	Ozs.(fine‡).	Value.	Calendar Year.	Ozs. (fine‡).	Value.
		$			$
1858	34,104	705,000	1887	33,558	693,709
1859	78,129	1,615,072	1888	29,834	616,731
1860	107,806	2,228,543	1889	28,489	588,923
1861	128,973	2,666,118	1890	23,918	494,436
1862	128,528	2,656,903	1891	20,792	429,811
1863	189,318	3,913,563	1892	19,327	399,525
1864	180,722	3,735,850	1893	18,360	379,535
1865	168,887	3,491,205	1894	25,564	530,530
1866	128,779	2,662,106	1895	61,289	1,266,954
1867	120,012	2,480,868	1896	86,504	1,788,206
1868	114,792	2,372,972	1897	131,805	2,724,657
1869	85,865	1,774,978	1898	142,215	2,939,852
1870	64,675	1,336,956	1899	203,295	4,202,473
1871	87,048	1,799,440	1900	228,916	4,732,105
1872	77,931	1,610,972	1901	257,292	5,318,703
1873	63,166	1,305,749	1902	288,383	5,961,409
1874	89,233	1,844,618	1903	284,108	5,873,036
1875	119,724	2,474,904	1904	275,975	5,704,908
1876	86,429	1,786,648	1905	285,529	5,902,402
1877	77,796	1,608,182	1906	269,886	5,579,031
1878	61,688	1,275,204	1907	236,216	4,883,020
1879	62,407	1,290,058	1908	286,858	5,929,880
1880	49,044	1,013,827	1909	250,320	5,174,579
1881	50,636	1,046,737	1910	261,386	5,403,318
1882	46,154	954,085	1911	238,496	4,930,145
1883	38,422	794,252	1912	251,815	5,205,485
1884	35,612	736,165			
1885	34,527	713,738		6,794,315	140,451,735
1886	43,714	903,651			

‡Calculated from the value : one dollar = 0·048375 oz.

The placer and hydraulic mining situation was favourable, and there was an increase in production in spite of a temporary shortage of water.

Among the camps of the Province, Rossland ranks first as a producer of gold from lode mines.

The chief companies now operating are:—

The Consolidated Mining and Smelting Co. of Canada, Ltd., owning the Centre Star, War Eagle, and Le Roi groups, shipped over 207,500 tons from these properties during the year.

The Le Roi No. Two Mining Co., Ltd, which is working the Le Roi Two, or Josie mine, shipped over 20,500 tons.

Some of the smaller properties of the camp also operated during the year.

The Boundary district comes next in gold production. The output is largely due to the large tonnage of copper ores mined in this district. These ores will average only 0·04 to 0·05 ounces of gold per ton. In addition, the Osoyoos Mining Division, which is included in this district, contains the Nickel Plate mine at Hedley, the premier gold mine of the Province. In the report for 1912 of the Hedley Gold Mining Co., the following details are given: tons milled, 70,455; assay value, $11.19; gold recovered, $748,133.14, or 95 per cent; reserve

tonnage of broken ore, 10,000; development during the year, 1,340 feet; di
drilling, 6,380 feet.

Several mills were in operation in the Nelson and Trail Creek distr

The copper ores of the Coast district in many cases do not carry
values, so that in spite of the increase in shipments there was a falling
the gold recovery from these ores.

Yukon.

The production of the Yukon in 1912 was $5,549,296, as compared
$4,634,574 in 1911, an increase of $914,722, or 19·7 per cent. In this is ine
the production from the lode mines.

The statistics of production of gold in the Yukon district during the
between 1898 and 1906, as given in Table 11, are based primarily on the rec
of gold at the United States mints and receiving offices, and credited t
Canadian Yukon. Although a royalty was exacted on the gold output, it s
certain that considerable amounts of gold were produced which escaped roy
payment, particularly during the years of high production.

Since 1906, however, the gold production of the Yukon, as ascertaine
the Interior Department, and on which royalty of 2½ per cent is imposed,
agreed fairly closely with the quantities reported at the United States receiv
offices as having been derived from the Canadian Yukon. For the purpos
collecting the royalty, a fixed value of $15 per ounce is placed on the cr
gold. The actual value of the gold will average somewhat higher than t
however. The average value of the deposits for a number of years, as sho
by the experience of the United States assay office, has been about $16.50
ounce. At the Canadian assay office at Vancouver, B.C., there were deposi
during the twelve months ending December 31, 1912, 2,211·88 ounces from
Yukon, valued, after all charges had been deducted, at $36,480.66, showing
average value of about $16.41 per ounce.

The production of crude placer gold in the Yukon during the past
years, as ascertained by the Department of the Interior, and upon which
royalty of 2½ per cent has been collected, is shown in the accompanying Tabl

Production of Crude Gold in the Yukon District.

Month.	1907.	1908.	1909.	1910.	1911.	1912.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
January	7,308·95	2,464·00	69·50	16·68	..	5·25
February	213·00	47·30	115·33	749·28	435·66	525·29
March	66·80	16·65	848·39	193·81	13·30	0·50
April	202·80	947·00	3·75	0·50		
May	35,736·62	6,851·96	117·33	43·83	16,719·16	26,158·66
June	31,402·14	51,530·90	62,254·92	54,301·17	38,499·39	54,243·03
July	26,793·50	35,291·11	52,126·43	37,942·31	42,783·38	58,283·29
August	22,392·10	37,930·99	47,440·83	47,673·06	47,677·49	56,975·55
September	33,119·51	39,654·27	44,466·20	57,695·65	48,383·63	53,225·29
October	35,589·70	37,028·98	26,572·23	51,888·18	58,690·82	66,518·01
November	200·30	1,989·39	4,858·69	21,404·29	11,097·51	11,648·08
December	52·80	5,491·76	892·75	3,563·75	13,130·63	7,432·72
	193,078·22	219,244·31	239,766·35	275,472·51	277,430·97	335,015·67

In 1912 the placer production is estimated at $5,539,808 in gold, representing 267,988 fine ounces of metal, and 60,302 fine ounces of silver, valued at $36,685, being at the average price of fine silver for the year, making a total valuation of the Yukon placer output of $5,576,493. In 1911 the placer production was estimated at $4,580,000, representing 221,557 fine ounces of gold and 50,300 fine ounces of silver, valued at $26,812, making a total valuation of $4,606,812.

Statistics of the annual production of gold in the district since 1885 are shown in Table 11.

GOLD.—TABLE 11.

Annual Production in Yukon.

Calendar Year.	Ozs. (fine‡).	Value.	Calendar Year.	Ozs. (fine‡).	Value.
		$			$
1885 } 1886 }	4,387	100,000	1899	774,000	16,000,000
1887	3,386	70,000	1900	1,077,553	22,275,000
1888	1,935	40,000	1901	870,750	18,000,000
1889	8,466	175,000	1902	701,437	14,500,000
1890	8,466	175,000	1903	592,594	12,250,000
1891	1,935	40,000	1904	407,938	10,500,000
1892	4,[illegible]	87,500	1905	381,001	7,876,000
1893	8,51[illegible]	176,000	1906	270,900	5,600,000
1894	6,047	125,000	1907	152,381	3,150,000
1895	12,094	250,000	1908	174,150	3,600,000
1896	14,513	300,000	1909	191,565	3,960,000
1897	120,937	2,500,000	1910*	224,091	4,570,362
1898	483,75[illegible]	10,000,000	1911*	224,197	4,634,574
			1912*	268,447	5,549,296
				7,087,117	146,503,732

‡ Calculated from the value: one dollar=0·048375 oz.
* Including a small production from lode mines.

Since 1898 a royalty to the extent of $3,990,513 has been collected
gold production of this district. The yearly amounts collected,
as the annual production of gold, as ascertained by the Interior Depa
are shown in the accompanying table. The difference between these
and those shown in Table 11, which are based on the mine receipts of
gold, has already been mentioned, and is probably due to two main factor
the fixing of the value of the gold for royalty purposes at $15 per ou
figure from $1 to $2 less than the actual value of the gold, and (2) the
ability that in the earlier years of royalty collection, considerable quanti
gold dust left the camps unrecorded and escaped royalty payment.

Gold Production in the Yukon, and Royalty Collected.‡

Fiscal Year.	Total gold production.	Total exemption.	Royalty collected on.	Roy pa
	$	$	$	
1898				
1899	3,072,773	339,845	2,732,928	27
1900	7,582,283	1,699,657	5,882,626	58
1901	9,809,464	2,501,744	7,307,720	73
1902	9,162,082	1,927,666	7,236,522	59
1903	9,566,340	1,199,114	8,367,225	33
1904	12,113,015		12,113,015	30
1905	10,790,663		10,790,663	27
1906	8,222,054		8,222,054	20
1907 (9 months)	6,540,007		6,540,007	163
1908	3,304,791		3,304,791	82
1909	2,820,162		2,820,162	70
1910	3,260,282		3,260,282	81
1911	3,594,251		3,594,251	89
1912	4,126,728		4,126,728	103
	4,024,237		4,024,237	100

‡ From the Report of the Yukon and Mining Lands Branch of the Department of the Inter

During the calendar year 1912 there were imported: gold bullion, valu
at $1,360,735; gold coins, $7,496,492; and manufactures of gold and silv
valued at $1,157,622.

The exports of gold, in dust, nuggets, ore, etc., in the same period we
valued at $10,014,654.

LEAD.

The following statistics of the production of lead in Canada in 1912 are based on direct smelter returns, and represent mainly the amount of lead refined in Canada, and shipped as pig lead, or manufactured products.

The 1912 output was almost entirely from the mines of British Columbia, and a considerable increase is shown, not only over 1911, but also over 1910, the production being 35,763,476 pounds in 1912, as against 23,784,969 pounds in 1911, and 32,987,508 pounds in 1910. A small shipment was made from Ontario mines, but in regard to this, figures are not available.

In valuing the lead production for 1912, the average price per pound at Montreal has been used. The New York market is practically closed to Canadian lead by the high tariff, and to the London market price must be added the freight, etc., to reach the Canadian market. The price at Montr[illegible], the main Canadian market for lead, is lower than that at New York, and higher than that at London, and is probably a more equitable valuation to place upon Canadian production.

Statistics showing the lead production since 1887 are given in the following table:—

LEAD. TABLE 1.

Annual Production.

Calendar Year.	Lbs.	Price per lb	Value.	Calendar Year.	Lbs.	Price per lb.	Value.
		Cts.	$			Cts.	$
1887	204,800	5·400	9,216	1900	63,169,821	4·370	2,760,521
1888	674,500	4·420	29,812	1901	51,900,958	4·334	2,249,387
1889	165,100	3·930	6,488	1902	22,956,381	4·069	934,095
1890	105,000	4·480	4,704	1903	18,139,283	4·237	768,562
1891	88,665	4·350	3,857	1904	37,531,244	4·309	1,617,221
1892	808,420	4·090	33,064	1905	56,864,915	4·707	2,676,632
1893	2,135,023	3·730	79,636	1906	54,608,217	5·677	3,089,187
1894	5,763,222	3·280	187,636	1907	47,738,703	5·325	2,542,086
1895	16,461,794	3·230	531,716	1908	43,195,733	4·200	1,811,221
1896	24,199,977	2·980	721,159	1909	45,857,424	*3·690	1,692,139
1897	39,018,219	3·580	1,396,853	1910	32,987,508	3·687	1,216,249
1898	31,915,319	3·780	1,206,399	1911	23,784,969	†3·480	827,717
1899	21,862,436	4·470	977,250	1912	35,763,476	†4·467	1,597,554

* In 1909 and 1910, average prices at Toronto as quoted by *Hardware and Metal*; in previous years average prices at New York, as quoted by *Engineering and Mining Journal*.

†1911 average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que.

Previous to 1904 lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces and exported in the form of base bullion to be refined abroad. A lead refinery employing the Betts Electrolytic Pro[illegible]s is

in operation at Trail, B.C., in connexion with the smelter there, and has witnessed frequent enlargements until it is now treating the base bullion produced from all the lead ores smelted at the Trail smelter.

Pig lead, fine gold, fine silver, refined antimony, copper sulphate, and babbit metal are produced at the refinery, and lead pipe is also manufactured there. The refined lead finds a market in Canada, the United States, and the Orient. Of that used in Canada a great part is consumed in the manufacture of white lead, for which the Trail product is especially valuable on account of its purity.

The production of refined lead, including pig lead and lead pipe, etc., has been as follows:—

Year.	Refined lead produced.	Year.	Refined lead produced.
1904	7,519,440	1909	41,883,614
1905	15,804,509	1910	32,987,508
1906	20,471,314	1911	24,784,969
1907	26,607,461	1912	35,715,258
1908	36,549,274		

The North American Smelting Company has erected a plant at Kingston, Ontario. This was operated during the latter part of 1912, treating ores from the United States and British Columbia.

Some British Columbian ores were also treated at the Tacoma Smelting Works, Tacoma, Washington, U.S.A.

The price of lead in London averages ¼ to 2 cents per pound lower than in New York.

The average price for soft lead in 1912 on the London market was £17 15s. 11d. per long ton (equivalent to 3.921 cents per pound), as compared with £13 19s. 3d. (2.992 cents per pound) in 1911, and £12 19s. (2.775 cents per pound) in 1910.

The price of lead on the Canadian market at Montreal is intermediate between the New York and London values. Montreal is the main Canadian market. The Toronto price in winter is about the same as that at Montreal, but the latter falls, during the period of summer freight rates, about 10 cents per 100 pounds below the former. The average price of lead in Montreal in 1912 was 4.467 cents per pound, against 3.921 in London, and 4.471 cents in New York.

The monthly and yearly average prices of lead in Montreal for the past five years are given in the following table:—

Price of Pig Lead at Montreal.*

Month.	1908.	1909	1910.	1911.	1912.
January	3·67	3·35	3·48	3·31	3·93
February	3·60	3·38	3·40	3·32	3·97
March	3·54	3·42	3·34	3·34	4·03
April	3·44	3·35	3·21	3·26	4·10
May	3·21	3·26	3·13	3·20	4·08
June	3·11	3·21	3·15	3·27	4·34
July	3·17	3·12	3·13	3·33	4·57
August	3·31	3·08	3·11	3·45	4·84
September	3·21	3·14	3·11	3·63	5·47
October	3·29	3·20	3·23	3·77	5·07
November	3·12	3·28	3·31	3·93	4·53
December	3·37	3·34	3·35	3·95	4·55
Average	3·361	3·268	3·216	3·480	4·467

*Producers prices for car load quantities ex cars Montreal as furnished by Messrs. Thos. Robertson & Co., Ltd., of Montreal.

The average prices of lead in New York, as quoted by the *Engineering and Mining Journal*, are shown in the following table:—

Monthly Average Prices of Lead in New York, in Cents per Pound.

Month.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.
January	4·000	4·075	4·347	4·552	5·600	6·000	3·691	4·175	4·700	4·483	4·435
February	4·075	4·075	4·375	4·450	5·464	6·000	3·725	4·018	4·613	4·420	4·026
March	4·075	4·442	4·475	4·470	5·350	6·000	3·838	3·986	4·450	4·394	4·073
April	4·075	4·567	4·475	4·500	5·404	6·000	3·963	4·168	4·376	4·412	4·209
May	4·075	4·325	4·423	4·500	5·685	6·000	4·253	4·287	4·315	4·375	4·194
June	4·075	4·210	4·196	4·500	5·750	5·760	4·466	4·350	4·343	4·435	4·392
July	4·075	4·075	4·192	4·524	5·750	5·288	4·447	4·321	4·104	4·393	4·720
August	4·075	4·075	4·192	4·565	5·750	5·250	4·580	4·363	4·000	4·500	4·579
September	4·075	4·075	4·411	4·850	5·750	4·813	4·515	4·342	4·000	4·485	5·048
October	4·075	4·243	4·200	4·850	5·750	4·750	4·351	4·341	4·000	4·295	5·071
November	4·075	4·375	4·200	4·850	5·750	4·376	4·330	4·370	4·442	4·298	4·615
December	4·075	4·218	4·200	5·200	5·750	4·376	4·330	4·370	4·442	4·298	4·615
Average	4·069	4·162	4·308	5·422	5·900	3·658	4·213	4·560	4·500	4·450	4·303
	4·069	4·237	4·309	4·707	5·657	5·325	4·200	4·273	4·446	4·420	4·471

The average monthly prices of soft lead in London, England, as published by Julius Matton, of London, and 'Metallgesellschaft,' of Frankfort-on-the-Main, were, from 1902 to 1912, as follows:—

Average Monthly Prices of Lead in London, £ per Long Ton.

Month.	1903.			1904.			1905.			1906.			1907.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	11	6	1	11	11	2	12	17	6	16	17	6	19	16	8
February	11	14	2	11	11	10	12	9	3	16	6	4	19	11	6
March	13	4	6	12	..	6	12	5	11	15	17	9	20	14	7
April	12	8	1	12	5	1	12	13	2	15	16	6	19	16	4
May	11	16		11	15	11	12	15	3	16	13	6	19	17	7
June	11	8	9	11	10	5	13	..	..	16	15	6	20	6	
July	11	7	8	11	13	4	13	12	2	16	11	7	20	8	2
August	11	2	11	11	14	9	13	19	2	17	1	3	19		3
September	11	3	4	11	15	9	13	19	.	18	4	4	19	17	6
October	11	2	2	12	3	9	14	13	7	19	7	9	18	13	
November	11	2	2	12	17	10	15	6	9	19	5	6	17	4	11
December	11	3	7	12	15	6	17	1	..	19	12	6	14	9	4
Yearly average	11	11	7	11	19	8	13	14	5	17	7	..	19	1	10

Month.	1908.			1909.			1910.			1911.			1912.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	14	10	6	13	3	6	13	3	11	13	..	8	15	11	3
February	14	5	6	13	5	5	13	7	3	13	1	11	15	13	9
March	14	1	4	13	8	8½	13	2	9	13	2	11	15	19	8
April	13	13	10	13	7	..	12	13	9	12	18	5	16	6	6
May	13	2	7	13	5	3	12	11	8	12	19	2	16	10	2
June	12	15	7	13	2	4	12	13	9	13	5	5	17	11	8
July	12	19	6	12	13	3	12	11	8	13	10	11	18	8	9
August	13	9	10½	12	10	6	12	10	10	14	1	4	19	5	8
September	13	3	6	12	15	3	12	12	6	14	15	1	21	9	0
October	13	7	3	13	4	4	13	2	..	15	6	1	20	8	0
November	13	12	2	13	1	4½	13	4	6	15	15	5	18	4	7
December	13	3	6	13	2	11½	13	3	9	15	13	4	18	1	6
Yearly average	13	10	5	13	1	8	12	19	..	13	19	3	17	15	11

Bounties. In 1901, and again in 1903, the Dominion Government, to encourage the lead industry, authorized the payment of a bounty on the production of lead. The Act of 1903 provided for the payment, under certain restrictions, of 75 cents per hundred pounds on lead contained in ore mined and smelted in Canada, provided that when the standard price of pig lead in London, England, exceeded £12 10s. per ton of 2,240 pounds, such bounty should be reduced proportionately by the amount of such excess. Thus, when the price of lead in London rose to £16, or over, per long ton, the bounty ceased. As the price of lead exceeded £16 sterling on the London market for a considerable period during 1906 and 1907 the bounty paid during those years was comparatively small.

The Act of 1903 provided that payment of bounty should cease on June 30, 1908, and as only a portion of the funds provided had been used, a new Act was passed in the latter year providing for further bounty payments at the rate of 75 cents per hundred pounds, or approximately £3 10s. per ton of 2,240

pounds, subject to the restriction that when the price of lead in London exceeds £14 10s. the bounty shall be reduced by such excess.

The Act of 1908 expired in 1913, and a new Act was passed extending the bounty for a further period of five years, with the same provisions. The text of this Act follows:—

3-4 GEORGE V, CHAPTER 9.

An Act Respecting the Payment of Bounties on Lead Contained in Lead-bearing Ores Mined in Canada.

[*Assented to June 6, 1913.*]

Whereas, under the provisions of chapter 31 of the statutes of 1903 and of chapter 43 of the statutes of 1908, as amended by chapter 37 of the statutes of 1910, the amount of bounty payable on lead contained in lead-bearing ores mined in Canada was not to exceed two million four hundred and fifty thousand dollars; and whereas the time within which the said amount is payable for the purpose aforesaid expires, under the provisions of the said chapter 43, on the thirtieth day of June, nineteen hundred and thirteen, and there will then remain unexpended of the said sum approximately six hundred thousand dollars; Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as *The Lead Bounties Act, 1913.*

2. The Governor in Council may authorize the payment of a bounty of seventy-five cents per one hundred pounds on lead contained in lead-bearing ores mined in Canada, on and after the first day of July, nineteen hundred and thirteen, such bounty to be paid to the producer or vendor of such ores: Provided that the sum to be paid as such bounty shall not exceed two hundred and fifty thousand dollars in any year ending on the thirtieth day of June; provided also that when it appears to the satisfaction of the Minister charged with the administration of this Act that the standard price of pig lead in London, England, exceeds fourteen pounds ten shillings sterling per ton of two thousand two hundred and forty pounds, such bounty shall be reduced by the amount of such excess.

2. The total amount of bounty payable under the provisions of chapter 31 of the statutes of 1903, chapter 43 of the statutes of 1908 (as amended by chapter 37 of the statutes of 1910), and of this Act, shall not exceed two million four hundred and fifty thousand dollars.

3. Payment of the said bounty may be made from time to time to the extent of sixty per cent upon smelter returns showing that the ore has been delivered for smelting at a smelter in Canada. The remaining forty per cent may be paid at the close of the fiscal year, upon evidence that all such ore has been smelted in Canada.

2. If at the close of any year it appears that during the year the quan tity of lead m[illegible]ced on which the bounty is authorized, exceeds sixtee thousand [illegible] hundred and sixty-seven tons of two thousand pounds, the rate o bounty shall be reduced to such sum as will bring the payments for the yea within th[illegible] tioned in section 2 of this Act.

4. If at any time it appears to the satisfaction of the Governor in Counc that the charges for transportation and treatment of lead ores in Canada ar excessive, or that there is any discrimination which prevents the smelting o such ores in Canada on fair and reasonable terms, the Governor in Counc may authorize the payment of bounty, at such reduced rates as he deems jus on the lead contained in such ores mined in Canada and exported for treatmen abroad.

5. If at any time it appears to the satisfaction of the Governor in Counc that products of lead are manufactured in Canada direct from lead ores mine in Canada without the intervention of the smelting process, the Governor i Council may make such provision as he deems equitable to extend the benefi of this Act to the producers of such ores.

6. The Governor in Council may make regulations for carrying out th intention of this Act.

7. The bounties payable under the provisions of this Act shall cease an determine on the thirtieth day of June, one thousand nine hundred an eighteen.

The regulations under which the Act is administered are as follows:—

1. The Minister of Trade and Commerce is charged with the administra tion of this Act.

2. All producers or vendors of lead-bearing ores who desire to avail them selves of the provisions of the Act above quoted, and to be paid bounty, shal before making claim for such bounty, notify the Minister of their intention t claim under the provisions of the Act, and shall declare the name of the min producing such ore, its situation, the names of the president, secretary, an manager, as well as the name of the official authorized to make claim. Notic shall be given the Minister of changes in ownership and management. Whe the bounty is claimed by lessees, the consent of the owner shall be shown.

3. All claims for the payment of bounty shall be made and substantiate under the oath of the manager of the mine, or of the official authorized to mak the claim.

4. Claims may be made monthly, that is, immediately after the close o each calendar month, and be in such form, and contain such evidence, as ma seem to the Minister, from time to time, necessary.

5. No claims made otherwise than in conformity with these regulations, and in form required by the Minister, shall be recognized, allowed or paid by the Minister.

6. The smelting of all such ores shall at all times be under the supervision of the officer of the Department of Trade and Commerce, appointed or detailed for the purpose.

7. The supervising officer may at any time demand and receive a portion of the floor sample of any ore delivered at the smelter for smelting purposes.

8. The rate of bounty shall be computed according to the London quotation upon the day the ore is taken into stock at the smelter, such day not to be later than the last day of the calendar month during which the ore was unloaded from cars at the smelter grounds.

9. The lead contents of ores shall, for the purpose of this Act, be ascertained by fire assay, as used in ordinary commercial assaying.

10. The books of the claimants, and those of the smelting works at which the ore is smelted, shall be at all times open to the inspection of such supervising officer, and of any officer of the Department of Trade and Commerce who may be detailed by the Minister for the purpose.

11. All claims shall be substantiated by the oath of the Manager of the smelting works at which the ores are smelted, and shall be verified and certified to by the officer of the Department of Trade and Commerce appointed to supervise the smelting at the works where it has been carried on.

12. The cost of the supervision shall be paid by the claimants and may be deducted pro rata according to the quantity smelted during the fiscal year, from the amount payable to such claimants at the close of each fiscal year.

Statement of Bounties Paid on Lead during the Fiscal Years 1899 to 1913.

Year ending	Bounty paid.	Year ending.	Bounty paid
	$		$
June 30, 1899	76,665	March 31, 1907 (9 mos.)	1,995
" 30, 1900	43,335	" 31, 1908	51,001
" 30, 1901	30,000	" 31, 1909	307,433
" 30, 1902		" 31, 1910	340,542
" 30, 1903	4,380	" 31, 1911	248,534
" 30, 1904	195,627	" 31, 1912	179,288
" 30, 1905	330,645	" 31, 1913	68,065
" 30, 1906	90,196	Total	1,967,708

Exports and Imports.—According to Trade and Navigation reports, the total quantity of lead contained in ore and concentrates exported during the

calendar year 1912 was 299,240 pounds, valued at $8,193. During 1911 the to
export, including also pig lead, was 137,061 pounds, valued at $4,632.

Details of exports 1908 to 1912 are as follows:—

Exports of Lead, 1908 to 1912.

	Lead in ore, concentrates, etc.		Pig lead.	
	Lbs.	Value.	Lbs.	Value
		$		$
1908.				
To United States	719,086	20,514	168,866	5,3
To other countries	3,792,845	132,880	13,773,797	463,7
Total	4,511,931	153,394	13,942,663	469,0
1909.				
To United States	6,096,852	126,478	280	
To other countries	129,216	6,100	11,301,680	361,0
Total	6,226,068	132,578	11,301,960	361,0
1910.				
To United States	46,800	1,308	59,605	2,3
To other countries			7,652,648	245,8
Total	46,800	1,308	7,712,253	248,1
1911.				
To United States	65,100	1,826	71,961	2,3
To other countries				
Total	65,100	1,826	71,961	2,3
1912				
To United States	299,240	8,193		
To other countries				
Total	299,240	8,193		

The exports of lead since 1873 are shown in Table 2.

LEAD.—TABLE 2.

Exports of Lead.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value
		$			$
1873		1,993	1893		3,0
1874		127	1894	5,792,700	144,3
1875		7,510	1895	23,675,892	435,0
1876		66	1896	26,480,320	462,0
1877		720	1897	43,802,697	925,1
1878			1898	37,375,678	885,1
1879		230	1899	15,799,518	466,5
1880			1900	57,642,029	1,917,0
1881			1901	45,590,995	1,804,0
1882		32	1902	17,761,484	457,1
1883		5	1903	18,624,303	426,4
1884		36	1904	25,868,825	559,4
1885			1905	41,657,403	1,046,3
1886			1906	21,496,022	736,0
1887		724	1907	25,591,883	1,029,3
1888		18	1908	18,454,594	622,4
1889		18	1909	17,528,028	493,0
1890			1910	7,759,653	249,4
1891		5,000	1911	137,061	4,0
1892		2,509	1912	299,240	8,1

The principal imports of lead during the calendar years 1910, 1911, and 1912 were as follows:—

	Cal. year 1910.		Cal. year 1911		Cal. year 1912.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
Old, scrap, pig, and block	6,030	346,516	9,989	495,923	14,089	940,583
Bars and sheets	885	45,674	1,542	55,458	961	93,702
Pipe	202	15,365	256	19,426	344	32,423
Shot and bullets	3	311	4	1,053	239	23,763
Manufactures of lead	.....	107,688	.....	108,012	.....	144,571
Tea lead	1,186	117,399	1,344	134,160	1,606	167,716
Litharge	777	56,049	899	65,743	1,296	113,941
Total	9,083	689,002	14,034	879,775	18,535	1,516,099
Metallic lead contained in imported lead pigments	1,461	.....	1,597	169,501	2,345	290,122
	10,544	.....	15,631	1,049,276	20,880	1,806,221

Statistics of the annual imports, since 1880, of lead and manufactures of lead, are given in Tables 3 and 4, imports of litharge in Table 5, and imports of dry white and red lead in Table 6.

LEAD.—TABLE 3.

Imports of Lead.

Fiscal Year.	Old, scrap, and pig.		Average price.	Bars, blocks, sheets		Average price.	Total.	
	Cwt.	Value.		Cwt.	Value.		Cwt.	Valu
		$	$		$	$		$
1880.	.....	.....	.....	.....	.....	.....	30,298	124,
1881.	16,236	56,919	3 51	18,222	70,744	3 88	34,458	127,
1882.	36,655	120,870	3 30	10,540	35,728	3 39	47,195	156,
1883.	18,680	148,759	3 06	8,591	28,785	3 35	57,371	177,
1884.	39,409	103,413	2 62	9,704	28,458	2 93	49,113	131,
1885.	36,106	87,038	2 41	9,362	24,396	2 61	45,468	111,
1886.	39,945	110,947	2 78	9,793	28,948	2 96	49,738	139,
1887.	61,160	173,477	2 84	14,153	41,746	2 95	75,313	215,
1888.	68,678	196,845	2 87	14,957	45,900	3 06	83,635	242,
1889.	74,223	213,132	2 87	14,173	43,482	3 07	88,396	256,
1890.	101,197	283,096	2 80	19,083	59,484	3 12	120,280	342,
1891.	86,382	243,033	2 81	15,646	48,220	3 08	102,028	291,
1892.	97,375	254,384	2 61	11,299	32,368	2 86	108,674	286,
1893.	94,485	215,521	2 28	12,403	32,286	2 60	106,888	247,
1894.	70,223	149,440	2 13	8,486	20,451	2 41	78,709	169,
1895.	67,261	139,280	2 07	6,739	16,315	2 42	74,000	155,
1896.	72,433	173,162	2 39	8,575	23,169	2 70	81,008	196,
1897	65,279	158,381	2 43	10,516	29,175	2 77	75,795	187,

	Old, scrap, pig, and block.*			Bars and sheets †			Total.	
1898.	88,420	260,779	2 95	22,214	39,041	1 76	110,634	299,
1899.	114,659	285,	2 47	44,796	39,833	89	159,455	323,
1900.	62,361	207,819	3 33	15,493	53,506	3 45	77,854	251,
1901	(a) 85,321	97,011	1 14	16,295	78,316	4 81	101,616	175,
1902.	(a)122,279	104,672	86	18,596	49,261	2 65	140,875	153,
1903	(a) 98,530	67,821	69	11,535	35,398	3 07	110,065	103,
1904	(a) 94,602	121,165	1 28	14,102	39,644	2 81	108,704	160,
1905.	(a) 57,074	133,775	2 34	17,792	51,972	2 92	74,866	185,
1906.	82,729	271,105	3 28	16,106	57,185	3 55	98,835	328,
1907.	79,575	277,470	3 49	13,710	56,630	4 13	93,285	334,
1908	63,921	284,604	4 45	17,253	75,186	4 36	81,174	359,
1909	50,110	151,173	3 02	13,754	46,093	3 35	63,864	197,
1910	113,249	191,971	1 70	11,446	37,004	3 23	124,695	228,
1911.	116,655	334,159	2 86	15,587	55,312	3 55	132,242	389,
1912.	241,030	602,990	2 50	29,901	52,886	1 77	270,931	655,

* Duty 15 per cent.

† Duty 25 per cent.

(a) Includes Canadian lead ore sent to the United States for refining, imported at price refining only.

LEAD. TABLE 4.

Imports of Lead Manufactures.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
1880	$ 15,400	1891	$ 23,898	1902	$ 120,020
1881	22,629	1892	22,636	1903	134,151
1882	17,282	1893	33,783	1904	129,093
1883	25,556	1894	29,361	1905	147,177
1884	31,361	1895	38,015	1906	163,793
1885	36,340	1896	50,722	1907	162,425
1886	33,078	1897	60,735	1908	24 ,926
1887	19,110	1898	63,179	1909	213,167
1888	18,816	1899	91,497	1910	234,930
1889	16,315	1900	104,736	1911	235,248
1890	25,600	1901	107,260	1912	272,625

LEAD.—TABLE 5.

Imports of Litharge.

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt	Value.
1880	3,041	$ 14,351	1891	7,979	$ 27,613	1902	13,602	$ 47,021
1881	6,126	22,129	1892	10,384	34,343	1903	13,921	47,761
1882	4,900	16,651	1893	7,685	24,401	1904	9,894	32,633
1883	1,532	6,173	1894	38,547	28,685	1905	17,865	57,736
1884	5,235	18,132	1895	11,955	32,953	1906	10,165	39,836
1885	4,990	16,156	1896	10,710	32,817	1907	11,311	49,183
1886	4,928	16,003	1897	12,028	34,538	1908	19,052	90,785
1887	6,397	21,865	1898	10,446	32,904	1909	12,117	43,597
1888	7,010	23,808	1899	9,530	22,518	1910	18,101	62,1 1
1889	8,089	31,082	1900	9,139	29,176	1911	16,543	59,987
1890	9,453	31,401	1901	11,132	51,914	1912	16,419	59 908

The imports of white and red lead and orange mineral in 1912 amounted to 5,753,854 pounds, valued at $290,122. In 1903 the imports were 19,208,786 pounds, the falling off being due to the establishment of corroding works in Canada.

Detailed statistics of imports of lead pigments during the calendar years 1910, 1911, and 1912 are as follows, the statistics of imports since 1885 being shown in Table 6:—

Imports of White and Red Lead in 1910, 1911, and 1912.

	Calendar Year 1910.		Calendar Year 1911.		Calendar Year	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Val
		$		$		$
Lead, white, dry	2,076,629	75,463	1,467,193	58,335	2,499,725	13
Lead, white, ground in oil	811,510	37,475	1,033,732	46,986	714,362	3
Lead, red, dry and orange mineral	881,788	31,803	1,571,508	64,180	2,539,767	11
	3,769,927	144,741	4,072,433	169,501	5,753,854	29

LEAD.—TABLE 6.

Imports of Dry White and Red Lead and Orange Mineral, and White Le Ground in Oil.

Fiscal Year.	Lbs.	Value.	Average price.	Fiscal Year.	Lbs.	Value.	Aver pric
		$	$ cts.			$	$
1885	5,540,753	198,913	3 69	1899	14,507,945	514,842	3 5
1886	6,703,077	213,258	3 18	1900	14,679,920	634,492	4 3
1887	6,998,820	233,725	3 34	1901	10,241,601	461,308	4 5
1888	6,361,334	216,654	3 41	1902	15,584,164	603,582	3 8
1889	7,066,465	267,236	3 78	1903	19,208,786	758,371	3 9
1890	10,859,672	381,959	3 52	1904	16,925,585	662,098	3 9
1891	8,560,615	337,407	3 94	1905	17,376,588	638,381	3 6
1892	10,288,766	351,686	3 42	1906	10,412,891	417,444	4 0
1893	10,865,183	364,680	3 36	1907	5,956,626	290,629	4 8
1894	10,958,170	353,053	3 22	1908	7,830,860	420,537	5 3
1895	8,780,052	282,353	3 22	1909	4,687,416	195,258	4 1
1896	11,711,496	367,569	3 14	1910	3,585,921	141,114	3 9
1897	10,310,463	347,539	3 37	1911	3,967,091	161,897	4 0
1898	12,682,868	448,659	3 54	1912	3,810,971	158,860	4 1

The production of lead as already shown was, in 1912, 17,882 tons, whi the exports of lead were 149 tons, leaving 17,733 tons as the consumption Canadian lead.

The imports of lead during the calendar year 1912 are shown to have bee 20,880 tons, not including certain manufactures of lead, valued at $144,571, that the total consumption of lead in 1912 probably exceeded 39,000 tons.

Nova Scotia.

There was no production from this Province during the year. There wa however, a certain amount of prospecting and development work done nea Musquodoboit and East Bay.

Quebec.

No production is reported. Development work was done at several points, including Calumet island, and also in Portneuf county.

Ontario.

A small shipment was made during the year, but details are not available.

At Kingston two smelters have been erected by the Buffalo and Ontario Smelting and Refining Co., and by the North American Smelting Co. The former propose to treat ores from the Cobalt district mainly, while the latter were operating during the latter portion of the year on lead ores from British Columbia and from the United States.

British Columbia.

As already stated, almost all the production of 1912 was from British Columbia, and there was a decided increase, as is shown in Table 7 following.

The record given in this table for the years 1909 to 1912, inclusive, represents the recovery of lead at smelter or refinery as distinguished from the figures given for the same years in Table 8, which indicate the quantities of lead in ore sent to the smelters.

LEAD.—TABLE 7.

British Columbia:—Production.

Calendar Year.	Lbs.	Value.	Price per pound	Calendar Year.	Lbs.	Value.	Price per pound.
		$	Cts.			$	Cts.
1887	204,800	9,216	4·40	1900	63,158,621	2,760,031	4·370
1888	674,500	29,813	4·42	1901	51,582,906	2,235,603	4·334
1889	165,100	6,488	3·93	1902	22,536,381	917,005	4·069
1890	Nil.			1903	18,089,283	766,443	4·237
1891	Nil.			1904	36,646,244	1,579,086	4·309
1892	808,420	33,064	4 09	1905	56,580,703	2,663,254	4·707
1893	2,131,092	79,490	3 73	1906	52,408,217	2,964,733	5·657
1894	5,703,222	187,636	3 29	1907	47,738,703	2,542,086	5 325
1895	16,461,794	531,716	3 23	1908	43,195,733	1,814,221	4 200
1896	24,199,977	721,159	2·98	1909	45,857,424	1,692,139	*3·690
1897	38,841,135	1,390,513	3·58	1910	32,987,508	1,216,249	3·687
1898	31,693,559	1,198,017	3 78	1911	23,784,969	827,717	†3·480
1899	21,862,436	977,250	4·470	1912	35,763,476	1,597,554	†4 467

* Average prices at Toronto for years 1909 and 1910. For previous years average prices at New York.

† Average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que.

LEAD.—TABLE 8.

British Columbia:—Production by Districts.*

	1906.	1907.	1908.	1909.	1910.	1911.	1912.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Cassiar	.. ....	....	....	....	1,695	238,578	41,3
East Kootenay							
Fort Steele	44,487,481	37,526,191	30,204,788	27,004,528	23,874,562	17,158,069	18,238,2
Other districts	167,691	73,842	358,270	18,724	66,610	.....	2,249,2
West Kootenay							
Ainsworth	3,173,353	3,054,775	4,790,216	10,298,343	2,558,353	289,009	4,863,8
Nelson	1,034,553	1,582,143	345,424	1,097,069	1,245,844	1,928,836	2,293,0
Slocan	2,975,674	4,305,826	6,572,268	4,976,191	6,406,358	6,705,571	16,944,8
Other districts	469,000	570,534	903,552	979,946	470,241	522,615	240,7
Yale	100,465	25,419	21,215	21,567	35,584	29,719	.....
	52,408,217	47,738,703	43,195,733	44,396,346	31,658,746	26,872,397	44,871,4

* From the Report of the Minister of Mines, B. C.

The increased output of this Province, in 1912, is due to the greate activity apparent in almost all the lead mining camps. In the West Kootena division, the Slocan, and Ainsworth districts were heavier shippers than usua Nelson contributed to the total, while, as usual, the East Kootenay properties produced a large tonnage.

The return of the Blue Bell, in Ainsworth district, added another heav shipper to the list.

Interest now centres round the silver-lead properties of Hazelton, in th Omineca. Though expected to ship in 1912, they were unable to do so unti transportation arrangements were completed. The first shipments were mad in January, 1913, and it is hoped are but the forerunners of a steady an increasing production.

NICKEL.

The mining and metallurgical treatment of the nickel-copper ores of the Sudbury district of Ontario has become one of the most important of Canada's metal mining industries, and special interest is attached to this industry because, at the present time, these deposits supply a very large portion of the world's consumption of nickel, and also because the present known available supplies of ore in the district appear to be sufficient for many years' operations. The past year's development work has largely increased the known ore reserves. Additional interest is lent to these ores by the valuable properties of the alloy of nickel and copper recently introduced to commerce under the name of monel metal, of which some particulars were given in the report for 1908.

These nickel-copper ore deposits have been the subject of special reports by the Mines Branch and Geological Survey, Ottawa, and by the Ontario Bureau of Mines at Toronto.[1] To these reports reference may be made for comprehensive descriptions of the geology of the district.

During 1912, shipments of nickel-copper ore were also made from the Alexo mine, near Kilburn, on the Porcupine branch of the Timiskaming and Northern Ontario railway, to the Mond Nickel Company, at Victoria Mines.

The production of ore and its reduction to a Bessemer matte was carried on during 1912 to a greater extent than in any previous year. There were mined during the year, 737,726 tons of ore, much of which is subjected to open air heap roasting before being smelted. There were smelted 725,065 tons, from which were produced 41,925 tons of Bessemer matte, carrying approximately 22,421 tons of nickel and 11,116 tons of copper. The net value of the matte was returned as $6,303,102. The matte, which is shipped to the United States and Great Britain for refining, carries about 80 per cent of the combined metals, having averaged for the past year 53·5 per cent of nickel and 26·3 per cent in copper.

For the production of monel metal, a special matte is produced with contents of 22 per cent copper and 58 per cent nickel, which is included in the total given above. Monel metal is produced from this special matte without the intermediate refining of either the nickel or the copper.

Compared with 1911 there was an increase in matte production, in 1912, of 9,318 tons, or 28·6 per cent, and the increase in total nickel content of matte was 5,372 tons, or 31·5 per cent. The total copper content of the matte was 11,116 tons, an increase of 2,150 tons, or 22·3 per cent.

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[1] Report on Nickel and Copper Deposits of Sudbury, Ont., by A. E. Barlow, Geological Survey, Canada. No. 873, 1901.
The Sudbury Nickel Region, by A. P. Coleman, Ph.D., Bureau of Mines, Vol XIV, Part III, 1904.
The Nickel Industry, with special reference to the Sudbury Region, Ont. Report by A. P. Coleman, Ph.D., Mines Branch, Ottawa, No. 170, 1913.

The following were the aggregate results of the operations on the nicke copper deposits of Ontario during the past four years:—

	1909.	1910.	1911.	1912.
	Tons of 2,000 lbs.	Tons of 2,000 lbs.	Tons of 2,000 lbs.	Tons of 2,00 lbs.
Ore mined	451,892	652,392	612,511	737,726
Ore smelted	462,336	628,947	610,834	725,065
Bessemer matte produced	25,845	35,033	32,607	41,925
Copper content of matte	7,873	9,630	8,966	11,116
Nickel " "	13,141	18,636	17,049	22,421
Spot value of matte	$3,913,017	$5,380,064	$4,945,592	$6,303,102
Wages paid mines and smelters	1,234,004	1,698,152	1,850,526	2,626,669
Men employed	1,573	1,882	1,885	3,110

According to Customs returns, exports of nickel in matte, etc., were, fo the twelve months ending December 31, as follows:—

	1908.	1909.	1910.	1911.	1912.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
To Great Britain	2,554,486	3,843,763	5,335,331	5,023,393	5,072,867
To United States	16,865,407	21,772,635	30,679,451	27,596,578	39,148,993
	19,419,893	25,616,398	36,014,782	32,619,971	44,221,860

The above figures of production do not include the nickel content of the silver-cobalt ores from the Cobalt district, of which it is difficult to obtain complete statistics. The shippers of silver-cobalt ores receive no return for the nickel content, although this metal forms an important constituent of the ore, and is probably to some extent saved by the refiners. Plants have been established by the Coniagas Reduction Company at Thorold, and the Deloro Mining and Reduction Company at Deloro, for the recovery of nickel and cobalt oxides.

During 1912 there were shipped from the cobalt-silver smelting works of Ontario, 349,054 pounds of cobalt oxide and nickel oxide, and 1,285,280 pounds of mixed cobalt and nickel oxides and cobalt material, having a total value of $320,244.

Bounty on Refined Nickel and Nickel Oxides.—Under the terms of 'The Metal Refining Act, 1907,' of the Province of Ontario (7 Edward VII, Chapter XIV), a bounty is authorized to be paid on nickel, cobalt, copper, and arsenic under certain conditions and restrictions during a period of five years following the passing of the Act (April, 1907). In March, 1912, the Act was amended to cover a further period of five years.

The sections affecting nickel ore are as follows:—

'The treasurer of the Province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-

Governor in Council, pay in each year to the refiners of the nickel or metal compounds hereinafter specified when refined in the Province from ores raised and mined in the Province, a bounty upon each pound of such metal or compound so refined, as follows:—

'Class I. On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel oxide; but nickel on which a bounty has already been paid in one form of product, shall not be entitled to any further bounty in any other form, and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all $30,000 in any one year.'

The full text of the Act will be found in the chapter on 'Cobalt.'

The price of refined nickel in New York during 1912 was quoted at from 40 to 45 cents per pound. Quotations being: large lots, contract basis, 40 to 45 cents a pound; retail spot, from 50 cents for 500 pound lots up to 55 cents for 200 pound lots. Price of electrolytic, 5 cents higher.

During 1911 the price of refined nickel was quoted in New York at from 40 to 45 cents per pound, according to size and terms of order.

Monel metal is finding an extended use in commerce; as this is put on the market at a price much lower than the final value of the metal content, an allowance has been made by adopting a lower price per pound for the nickel production than market quotations.

Statistics of the quantities of nickel contained in matte produced are shown in the following table, the values being based on the final value of the metal, either as refined or as monel metal.

Statistics of the quantities of ore mined and smelted, matte produced, etc., will be found in the chapter on 'Smelter Production.'

NICKEL. TABLE 1.

Annual Production.

Calendar Year.	Pounds of nickel in matte shipped.	Average price per lb.	Value.	Calendar Year.	Pounds of nickel in matte shipped.	Average price per lb.	Value.
		Cts.	$			Cts.	$
1889	*830,477	60	498,286	1901	9,189,047	50	4,594,523
1890	1,435,742	65	933,232	1902	16,593,410	47	5,025,903
1891	4,035,347	60	2,421,208	1903	12,505,510	40	5,002,204
1892	2,413,717	58	1,399,956	1904	10,547,883	40	4,219,153
1893	3,982,982	52	2,071,151	1905	18,876,315	40	7,550,526
1894	4,907,430	38½	1,870,958	1906	21,490,955	42	8,948,831
1895	3,888,525	35	1,360,984	1907	21,189,793	45	9,535,407
1896	3,397,113	35	1,188,990	1908	19,143,111	43	8,231,538
1897	3,997,647	35	1,399,176	1909	26,282,291	36	9,461,877
1898	5,517,690	33	1,820,838	1910	37,271,033	30	11,181,310
1899	5,744,000	36	2,067,840	1911	34,098,744	30	10,229,623
1900	7,080,227	47	3,327,707	1912	44,811,542	30	13,452,463

* Calculated from shipments made by rail.

The companies engaged in mining and smelting nickel ores are: The Canadian Copper Company (the International Nickel Company, Copper Cliff, Ont., and New York); the Mond Nickel Company, Coniston, Ont., and London, England. The latter Company has erected a new smelter at Coniston, Ontario, to replace that at Victoria Mines. A new company is entering this field: the Dominion Nickel-Copper Company. A number of mining properties have been secured, as well as a smelter site near Massey, Ontario.

The Alexo mine on the Porcupine branch of the Timiskaming and Northern Ontario railway, produced during the year, shipping nickel-copper ore to the Mond smelter at Victoria Mines.

Reference has already been made to the occurrence of nickel as one of the minor constituents of the silver ores of the Cobalt district. The quantity of nickel contained in the ores from this district has been estimated by the Ontario Bureau of Mines, as follows:—

Year.	Ore shipped.	Nickel content
	Tons.	Tons.
1904	158	14
1905	2,144	75
1906	5,335	160
1907	14,788	370
1908	25,624	612
1909	30,077	766
1910	34,282	601
1911	26,653	392
1912	....	....

A large portion of these ores, particularly the high grade, is now being reduced at Thorold, Deloro, and Orillia, and shipments were made to three new smelters at Kingston, North Bay, and Welland.

At some of these plants, in addition to silver bullion and white arsenic, there is a recovery of nickel oxide and cobalt oxide.

Statistics of the exports of nickel, as compiled from the Customs Department reports, are shown in Table 2, and imports in Table 3.

NICKEL. TABLE 2.

Exports of Nickel Contained in Ore, Matte, or Other Product.

Calendar Year.	Value.	Calendar Year.	Lbs.	Value.	Average price.
	$			$	Cts.
1890	80,568	1903	12,699,227	1,116,099	8 78
1891	607,280	1904	11,233,869	1,091,349	9 71
1892	293,119	1905	17,318,659	1,569,393	9 06
1893	629,602	1906	20,653,845	2,042,365	9 89
1894	559,356	1907	19,276,335	2,280,374	11 76
1895	521,783	1908	19,419,893	1,866,924	9 61
1896	658,213	1909	25,046,398	2,676,483	10 15
1897	723,130	1910	36,014,782	4,030,040	11 19
1898	1,019,363	1911	32,619,971	3,676,396	11 27
1899	939,915	1912	44,221,860	4,661,758	10 54
1900	1,031,030				
1901	751,080				
1902	1,007,211				

NICKEL. TABLE 3.

Imports of Nickel and Nickel Anodes.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1890	3,154	1898	5,882	1906	15,976
1891	3,889	1899	9,449	1907	19,511
1892	3,208	1900	6,988	1908	8,870
1893	2,905	1901	12,020	1909	14,930
1894	3,528	1902	15,448	1910	23,206
1895	4,267	1903	26,177	1911	22,693
1896	4,787	1904	11,682	1912	34,121
1897	4,737	1905	19,076		

During the calendar year 19 there was an import of 'nickel, nickel-silver, and German-silver in ingots or blocks' to the extent of 48,245 pounds, valued at $17,957, and 'nickel in bars and rods,' 619,523 pounds, valued at $154,387.

The only other important producer of nickel ore outside of Canada is the French colony of New Caledonia. The exports of nickel from this source since 1898 have been as follows in metric tons:—

Exports of Nickel Ore from New Caledonia.[1]

Year.	Metric tons.	Year.	Metric tons.	Year.	Metric tons.
1898	53,200	1903	77,360	1908	108,000
1899	103,908	1904	98,655	1909	86,000
1900	100,319	1905	125,289	1910	93,000
1901	133,814	1906	118,830	1911	[2]142,000
1902	129,653	1907	120,107	1912	72,315

[1] Statistique de l'Industrie Minérale en France et en Algérie, Paris.
[2] Production.

The nickel ore of New Caledonia carries about 6½ per cent of nickel. Practically all the above ore is smelted in France, Germany, and England.

The 'Statistique de l'Industrie Minérale en France et en Algérie 1911' states: 'The production of nickel from New Caledonia ores took place at two plants situated, respectively, at Havre and Dieppe. The output of this metal was, in 1911, 1880 metric tons, a decrease from 2,000 tons in 1910. Its value was, as formerly, 3,500 francs per ton.

'New Caledonia.—The production of nickel ore in 1911 was 142,000 metric tons, against 99,000 tons in 1910. The exports are made up as follows: 120,000 tons of ore, valued at 3,600,000 francs, or 30 francs per ton, and 2,950 tons of matte, valued at 2,137,600 francs, or 724 francs per ton.'

The production of raw nickel at smelting works (partly estimated) is given by the Metallgesellschaft as follows, in metric tons:—

Production of Raw Nickel at Smelting Works, in Metric Tons.

Producing country.	1904.	1905.	1906	1907.	1908.	1909.	1910.	1911.	1912.
United States of North America and Canada. ..	6,000	4,500	6,500	6,500	7,000	9,000	10,000	12,000	15,000
England	2,200	3,100	3,200	3,200	3,000	3,200	3,500	4,500	5,200
Germany [1].....	2,000	2,700	2,800	2,600	3,000	3,500	4,500	5,000	5,000
France	1,800	2,200	1,800	1,800	1,400	1,200	1,500	2,000	2,100
Other countries..... ...	.....	.....	.....	.....	200	400	600	1,000	1,200
Total production [2].....	12,000	12,500	14,300	14,100	14,600	17,300	20,100	24,500	28,500

[1] The figures of production stated for Germany only cover the output in the Kingdom of Prussia; nickel is also produced in the Kingdom of Saxony, but no data are obtainable of this production, which is, however, not important.

[2] The entire production of nickel, apart from quite insignificant quantities obtained in Germany, Norway, and the United States of America, comes from New Caledonian and Canadian ores.

Statistics of the average yearly prices in Europe as given by the same authority are as follows:—

Yearly Average Prices of Nickel in Europe in Cents per Pound, and Marks per Kilogram.

Year.	Prices in marks per kilo.	Cents per lb.	Year.	Prices in marks per kilo.	Cents per lb.
1889..	1·50	48·6	1901..	3·00	32·4
1890..	1·50	18·6	1902..	3·20	31·6
1891..	1·50	48·6	1903..	3·30	35·6
1892..	1·50	48·6	1904..	3·30	35·6
1893..	3·80	41·0	1905..	3·30	35·6
1894..	3·69	38·9	1906..	3·80	41·0
1895..	2·60	28·1	1907..	3·50	37·8
1896..	2·50	27·0	1908..	3·25	35·2
1897..	2·50	27·0	1909..	3·25	35·2
1898..	2·50	27·0	1910..	3·25	35·2
1899..	2·50	27·0	1911..	3·25	35·2
1900..	3·00	32·4	1912..	3·25	35·2

Mark = 23·8 cents. Kilogram = 2·20462 lbs.

SILVER.

Silver has, with the rapid development of the Cobalt camp in Ontario, risen in point of total value of output to second place in the list of our mineral products, being exceeded only by coal.

In 1912 the total production of silver, including that produced as bullion and the metal estimated as recovered from ores sent to smelters or otherwise treated, was reported as 31,955,560 fine ounces which, compared with a production of 32,559,044 ounces in 1911, shows a decrease of 1·85 per cent.

The average value of fine silver in 1912 was, however, according to New York quotations, 60·835 cents per ounce, as compared with an average value of 53·304 cents in 1911, an increase of about 14·13 per cent.

The total value of the silver production in 1912 was $19,440,165, an increase of 12·01 per cent over the value, $17,355,272, in 1911.

A comparison of the production of 1911 and 1910 shows a decrease for 1911 of 310,220 ounces, or 0·94 per cent in quantity, and $225,183, or 1·28 per cent in value, the average price having decreased about 0·34 per cent from 1910.

Statistics of the annual production of silver since 1887 are shown in Table 1.

SILVER. TABLE 1.

Annual Production, 1887-1912.

Year.	Ozs.	Value.	Average price per oz.	Year.	Ozs.	Value.	Average price per oz.
		$	Cts.			$	Cts.
1887	355,083	347,271	98·00	1900	4,468,225	2,740,362	61·33
1888	437,232	410,998	94·00	1901	5,539,192	3,265,354	58·95
1889	383,318	358,785	93·60	1902	4,291,317	2,238,351	52·16
1890	409,687	419,118	104·60	1903	3,198,581	1,709,642	53·45
1891	411,523	409,549	98·00	1904	3,577,526	2,047,695	57·22
1892	310,651	272,130	86·00	1905	6,000,023	3,621,133	60·35
1893		330,128	77·00	1906	8,473,379	5,650,455	66·70
1894	847,625	534,049	63·00	1907	12,779,799	8,348,659	65·33
1895	1,578,275	1,030,299	65·28	1908	22,106,233	11,686,239	52·86
1896	3,205,313	2,149,503	67·06	1909	27,529,473	14,178,501	51·50
1897	5,558,456	3,324,395	59·79	1910	32,869,261	17,580,455	53·49
1898	4,452,333	2,593,929	58·26	1911	32,559,044	17,355,272	53·30
1899	3,411,641	2,032,658	59·58	1912	31,995,560	19,440,165	60·83

From 1887 to 1893 the production ranged in value between $300,000 and $400,000, and was derived chiefly from the Provinces of Ontario and Quebec. The next three years saw a rapid increase in the production, due to the development of the silver-lead deposits of British Columbia, and in 1896 a production of over $2,000,000 is recorded. From that year until 1905 the production varied from $2,000,000 to $3,500,000, rising rapidly during the next six years to $17,355,272, in 1911, as a result of the discovery of the rich ores of the Cobalt

district. In 1912 there was again a considerable increase in value, thou there was actually a falling off in the number of ounces produced.

Ontario, in 1905, produced 40·9 per cent of the total output of Canada; 1911, the production was 93·8 per cent—practically all from the Cobalt distric

In 1912, Ontario produced 91·3 per cent, while the contribution of Briti Columbia rose to 8·3 per cent. Statistics of the annual production in ea province are separately shown in Table 2.

SILVER.—TABLE 2.

Production by Provinces, 1887-1912.

Calendar Year.	Ontario.		Quebec.		British Columbia.		Yukon Territory.	
	Ozs.	Value.	Ozs.	Value.	Ozs.	Value.	Ozs.	Valu
		$		$		$		$
1887	190,495	186,304	146,898	143,666	17,690	17,301	.....	
1888	208,064	195,580	149,388	140,425	79,780	74,993	.....	
1889	181,609	169,986	148,517	139,012	53,192	49,787	.....	
1890	158,715	166,016	171,545	179,436	70,427	73,666	.....	
1891	225,633	222,926	185,584	185,357	3,306	3,266	.....	
1892	41,581	36,425	191,910	168,113	77,160	67,592	.....	
1893	.....	8,689	.....	126,439	.....	195,000	.....	
1894	.....	.....	101,318	63,830	746,379	470,219	.....	
1895	.....	.....	81,753	53,369	1,496,522	976,930	.....	
1896	.....	.....	70,000	46,942	3,135,343	2,102,561	.....	
1897	5,000	2,990	80,475	48,116	5,472,971	3,272,289	.....	
1898	85,000	49,521	74,932	43,655	4,292,491	2,500,753	.....	
1899	202,000	120,352	40,231	23,970	2,939,413	1,751,302	230,000	137,03
1900	161,650	99,140	58,400	35,817	3,958,175	2,427,548	290,000	177,85
1901	151,400	89,250	41,459	24,440	5,151,333	3,036,711	195,000	114,95
1902	145,000	75,632	42,500	22,168	3,917,917	2,043,586	185,000	96,98
1903	17,777	9,502	28,600	15,287	2,906,204	1,601,471	156,000	83,36
1904	206,875	118,376	15,000	8,583	3,222,481	1,843,935	133,170	76,20
1905	2,451,356	1,479,442	19,620	11,841	3,439,417	2,075,757	89,530	54,06
1906	5,401,766	3,607,894	17,686	11,813	2,990,262	1,997,226	63,665	42,52
1907	9,982,363	6,521,178	16,000	10,452	2,745,448	1,793,519	35,988	23,51
1908	19,398,545	10,254,847	13,299	7,030	2,631,389	1,391,058	63,000	33,30
1909	24,822,099	12,784,126	13,233	6,815	2,649,141	1,364,387	45,000	23,17
1910	30,366,366	16,241,755	7,593	4,061	2,407,887	1,287,883	87,418	46,75
1911	30,540,754	16,279,443	18,435	9,827	1,887,147	1,005,924	112,708	60,07
1912	29,214,025	17,772,352	9,465	5,758	2,651,002	1,612,737	81,068	49,31

The average price of fine silver in New York during 1912 varied between a minimum of 54⅞ cents per ounce in January, and a maximum of 64¼ cents in October, the average price for the year being 60·835 cents per ounce.

In London the average price of silver in 1912 was 28·042 pence per standard ounce of a fineness of 0·925. For the year 1911 the average price per fine ounce in New York was 53·304 cents, the highest being 55·7 cents in November, and the lowest 52·1 cents in August of that year.

The average monthly prices of silver in New York from 1908 to 1912, and in London during 1912, are shown in tabulated form following:—

Average Monthly Prices of Silver.

Months.	New York.—Cents per fine ounce.					London.—Pence per Standard ounce (*a*).
	1908.	1909.	1910.	1911.	1912.	1912.
January	55·678	51·750	52·375	53·795	56·260	25·887
February	56·000	51·472	51·534	52·222	55·043	27·190
March	55·365	50·468	51·454	52·745	58·375	26·875
April	54·505	51·428	53·221	53·325	59·267	27·284
May	52·795	52·305	53·870	53·308	60·880	28·038
June	53·663	52·538	53·462	53·043	61·290	28·215
July	53·115	51·043	54·150	52·630	60·654	27·919
August	51·683	51·125	52·912	52·171	61·606	28·375
September	·20	51·449	53·295	52·440	63·078	29·088
October	-	50·923	55·490	53·340	63·471	29·299
November	.	50·703	55·635	55·719	62·792	29·012
December	·.·.·	52·226	54·428	54·905	63·365	29·320
Average for the year	52·864	51·503	53·486	53·304	60·835	28·042

(*a*) 925 parts fine.

Important quantities of silver are now being produced in Canada, both as fine metal and as silver bullion, ranging in fineness from 850 to 998·9 Fine silver is produced at Trail, B.C., by the Consolidated Mining and Smelting Company of Canada, Limited, chiefly from the silver-lead ores of that Province, and is shipped to China, the United States, and to the Ottawa mint.

The annual production of fine silver at Trail since 1904 has been as follows:—

Year.	Fine ozs.	Year.	Fine ozs.
1904	551,150	1910	1,798,960
1905	1,088,328	1911	1,325,601
1906	1,263,809	1912	1,896,999
1907	1,631,422		
1908	1,956,039	Total	13,515,611
1909	2,003,003		

In Ontario, ores from the Cobalt district are treated by:—

The Canada Smelting and Refining Co., Orillia, Ont.
Coniagas Reduction Co., Thorold, Ont.
Deloro Mining and Reduction Co., Deloro, Ont.
Buffalo and Ontario Smelting and Refining Co., Kingston, Ont.
Dominion Refineries, North Bay, Ont.
Metals Chemical Co., Welland, Ont.

The Canadian Copper Company, which was treating ores from this district, closed down their plant at the end of 1912.

Silver bullion of a fineness varying from 850 to 998·2 is produced at the works, other products being white arsenic, and, more recently, nickel and cobalt oxides or mixed oxides. The silver bullion, as a rule, finds a market in the United States and in England.

Bullion shipped in 1907 contained 4,449,722 fine ounces of silver; in 1908, 11,168,689 ounces; in 1909, 14,385,985 ounces; in 1910, 17,365,165 ounces; and in 1911, 17,753,167 fine ounces. In 1912 these smelters produced 15,675,218 fine ounces, while United States smelters report a content of 8,463,288 ounces silver in 25,758,282 pounds of ore received.

Quebec.

The small quantity of silver credited to Quebec province for a number of years represents a small silver content of the pyritic ores mined at Eustis and Weedon, in the Eastern Townships.

Ontario.

From a production of $118,376, in 1904, the silver output of the Province has grown to a value of $17,772,352, in 1912. Not only does this constitute about 91·3 per cent of the total production of Canada, but it forms about 13 per cent of the production of the world, Canada, as a whole, ranking third among the producers, with a contribution of about 15 per cent.

According to returns received by this Department, there were shipped during 1912, 17,899 tons of ore, and 11,217 tons of concentrates, or a total of 29,116 tons, having a value of $14,855,169, besides silver bullion shipped, carrying 4,778,852 fine ounces of silver.

The silver content of ore shipped was estimated as 15,929,289 ounces, or an average of 890 ounces per ton, and the concentrates shipped as 9,774,697 ounces, or an average of 871 ounces per ton, the total silver content of ore concentrates and bullion shipped from Cobalt district being 30,482,838 ounces. The mine owners receive payment for only 93 to 98 per cent of the silver content, and in estimating and valuing the production a deduction of 5 per cent is made from silver contained in ore and concentrates to cover losses in smelting and refining. On this basis, the silver recovery is estimated at 29,197,639 ounces, and valued at $17,762,384.

No payments for cobalt content were reported, but considerable interest was aroused by the news of payment being made for a small copper content in several shipments.

In the following table a record of shipments since 1904 is given, the figures for the first three years being those published by the Ontario Bureau of Mines:—

Silver Ore and Bullion Shipments from Cobalt Mines, 1904-1912.

Year.	Shipments.		Silver content.		Silver in ounces, per ton.		Silver bullion shipments. Fine ounces	Total value of silver.
	Ore. Tons.	Concentrate. Tons.	Ore. Ozs.	Concentrate. Ozs.	Ore.	Concentrate.		
								$
1904	158		206,875		1,309			118,376
1905	2,144		2,451,356		1,143			1,473,192
1906	5,335		5,401,766		1,013			3,607,894
1907	14,644		9,982,363		682			6,521,178
1908	25,682	*	19,398,545	*	755	*		10,254,847
1909	27,835	3,059	22,349,717	3,627,819	803	1,186	143,440	12,784,126
1910	28,684	6,943	23,797,111	7,111,579	830	1,024	1,003,111	16,241,755
1911	15,417	9,329	20,065,621	8,118,231	1,300	870	3,766,022	16,279,443
1912	17,899	11,217	15,929,289	9,774,697	890	871	4,778,852	17,762,384

* Included with ore.

As the camp has developed the average grade of ore shipped has gradually diminished. The introduction of concentration plants in 1908 has tended to keep the ore shipped up to a high standard, but again there is a tendency to convert the ore directly into bullion for shipment, and treat the high grade ore also at the mines.

During 1912 payment was not made for the cobalt nickel or arsenic content of the ore, and in some cases the latter was [illegible]ized.

The total metal content of these ores, as [illegible]ted by the Ontario Bureau of Mines, is shown in the next table. The figure[illegible] ore shipments and silver content, while not identical, agree very closely with those given in the previous table.

Total Production Cobalt Mines, 1904-1912.*

Year.	Ore and concentrate shipped.	Metallic content.			
		Nickel.	Cobalt.	Arsenic.	Silver.
	Tons.	Tons.	Tons.	Tons.	Ozs.
1904	158	14	16	72	206,875
1905	2,144	75	118	540	2,451,356
1906	5,335	160	321	1,440	5,401,766
1907	14,788	370	739	2,958	10,023,311
1908	25,624	612	1,224	3,672	19,437,875
1909	30,677	766	1,533	4,294	25,897,825
1910	34,282	604	1,098	4,897	430,645,181
1911	26,633	362	852	3,806	31,507,791
1912	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* As per Ontario Bureau of Mines.
† Bullion shipments from mines included.

About 28 per cent of the ore shipped from Cobalt was treated in metallurgical works in Canada, and white arsenic is being produced therefrom, of which record will be found under 'Smelter Production.'

While the greater number of the mining companies hold unrestricted titles to their properties, several are operated on a royalty basis on mining lands owned and leased by the Timiskaming and Northern Ontario Railway Commission. Mr. Arthur A. Cole, Mining Engineer to the Commission, has, in his annual report, compiled some very interesting statistics covering the whole district with respect to ore shipments, concentration, power, and labour, etc., from which the following tables and extracts have been drawn:—

Ore Shipments from the Cobalt District for the Years 1904 to 1912.

Mine.	1904. to 1907.	1908.	1909.	1910.	1911.	1912.	Totals. 1904-1912.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Badger	...	...	...	...	27·10	...	27·10
Bailey	30·00	88·80	36·85	...	20·00	41 57	217 ·22
Beaver	...	...	51·38	140·06	790·81	40_ 97	1,385 22
Buffalo	2,435·14	536 90	648·86	1,185·77	1,275·19	1,251·64	7,333·50
Casey-Cobalt	...	10·00	8·50	48·40	277·74	214·34	558·98
Chambers-Ferland	...	223·89	517·88	885·92	622·85	501·29	2,751·83
City of Cobalt	50·61	761·04	566·82	329·40	281·30	230·00	2,219·17
Cobalt Lake	...	225·97	95·47	286·80	2,111·32	1,085·22	3,812·78
Cobalt Townsite	143·22	177·71	27·35	310·99	703·51	1,944·77	3,307·55
Colonial	55·38	...	...	178·60	114·10	80·48	434 56
Coniagas	2,899·99	610·25	806·93	1,261·46	1,813·89	2,119·87	9,512·39
Crown Reserve	...	657·35	3,167·52	2,814·25	977·32	561·65	8,178·09
Drummond	411·48	1,161·38	1,225·47	2,194·41	714·83	458·85	6,166·42
Foster	512·98	191·20	113·90	...	...	...	818·08
Green Meehan	135·42	...	...	...	102·98	...	238·40
†Hargrave	28·45	...	...	343 68	102·44	17·35	491·92
Hudson Bay	149·53	1,094·23	743·64	260 33	898·88	694·55	3,841·16
Imperial Cobalt	14·61	...	...	...	...	...	14·61
Kerr Lake	533·09	660·24	1,173·42	5,088·78	1,292·58	788·10	9,536·18
King Edward (Watts)	50·12	338·19	146·58	134·12	20 00	...	689·01
LaRose	4,337·97	4,843·17	6,757·21	5,131·53	3,581·54	3,511·40	28,162·82
‡Lawson	75·73	...	...	...	...	...	75·73
Lost and Found	...	...	...	...	...	65·20	65·20
McKinley-Darragh	467·09	1,808·39	1,056·49	2,393·39	1,238·64	2,673·40	12,460·27
Nancy Helen	...	201·32	116·32	...	...	...	347·74
Nipissing	...	3,571·96	6,470·52	6,833·81	2,952·20	1,869·27	26,904·12
Nova Scotia	...	237·95	224·79	...	...	...	778·90
North Cobalt	...	...	6·87	...	3·00	...	9 87
O'Brien	...	3,459·51	1,419·11	608·57	628·44	711·43	8,459·17
*Penn Canadian	77·33	187·99	339·01	285·62	22·40	126 35	1,038·70
Peterson Lake Leases (Little Nipissing)	...	40·67	39·62	313·76	28·45	...	422·50
(Nova Scotia)	...	...	121 15	...	...	...	121·15
Seneca Superior	...	...	...	...	...	432·97	432 97
Provincial	...	75·84	...	52·65	100·54	22·22	250·65
‡Princess	3·93	...	...	...	...	...	3 93
Red Rock	45·71	...	...	...	...	...	45·71
Right of Way	175·62	750·04	1,608·99	981·41	666·06	243·24	4,425·36
Rochester	...	...	...	28·30	...	...	28·30
Silver Bar	...	0·58	...	...	2·72	...	3·30
Silver Cliff	...	160·44	149·06	156·84	92·30	...	558·64
Silver Leaf	55·36	197·03	...	...	...	...	252 39
Silver Queen	654·14	885·70	316·64	...	...	31·25	1,887·83
Timiskaming	204·32	795 20	852 14	1,119·12	855·60	967·31	4,793 69
Timiskaming-Cobalt	88·45	...	...	...	...	...	88 45
Trethewey	1,271·64	1,408·69	1,134·50	536·64	602·98	579·10	5,533·55
‡University	231·51	...	...	...	...	...	231·51
Victoria	...	0·47	...	...	...	...	0·47
Violet	36·00	...	...	38·81	...	...	36·00
Waldman	...	...	...	24 15	...	...	38 81
Wyandoh	...	...	...	...	...	...	24·15
Total	23,182·42	25,362·10	29,942·99	33,976 97	24,921·71	21,631 79	159,018 05

† The shipment in 1905 was made by the White Silver Mining Co., the former owner of the Hargrave property.

‡ Shipments from Lawson, Princess, and University since 1907, included with LaRose.

*Shipments up to the end of 1911 made by the Cobalt Central Mining Company former owner of the Penn Canadian.

Ore Shipments from Cobalt Silver District, for the Calendar Year 1912.

Mine.	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	December.	Totals.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
Bailey													
Beaver		62·00								21·57		20·00	41·57
Buffalo	90·20	117·85	132·34	63·05	55·55		38·76	63·82	55·12				
Casey Cobalt		24·50		84·84	92·24	123·48	114·53	92·10	124·91	95·09	64·37		402·97
Chambers-Ferland	32·00	32·00	32·00	33·60	64·06	43·85	102·40		43·59			184·06	1,251·64
City of Cobalt		54·00	25·81	32·70		32·00	31·70	32·00	73·29	65·50			214·34
Cobalt Townsite	96·85	66·02	71·00					75·49			42·00	73·20	501·29
Cobalt Lake		37·54	65·72	178·12	157·62	199·20	144·30	216·65	241·78	285·33	87·65		230·00
Coniagas	170·01	124·86	112·15	72·33	31·15	134·85	91·69	121·50	128·74	123·74	151·43	200·25	1,944·77
Colonial	20·00			303·36	172·35	117·54	137·33	207·94	163·95	158·39	215·38	126·53	1,085·22
Crown Reserve	68·27	21·85	59·17	41·82	21·60			21·55				236·61	2,119·87
Drummond		300·00			38·95	49·03	21·49	47·49	41·02	57·12	19·61	23·33	86·48
Hargrave					18·56	20·74			52·75			115·83	561·65
Hudson Bay	62·95	61·58	63·34	62·03	62·75	31·60	96·86	62·80				66·80	458·85
Kerr Lake	30·29	83·00	84·18	85·38	50·77	30·37	60·55	105·78	35·61	30·85	93·26	17·35	17·35
LaRose	217·60	276·46	353·78	255·79	421·03	271·96	152·63	342·37	45·93	90·95	92·00	30·92	694·55
Lost and Found*						15·00			315·23	251·17	260·62	28·90	788·10
McKinley-Darragh	169·28	225·70	295·79	212·41	220·38	202·81	348·78	168·52	151·79	17·80		386·76	3,511·40
Nipissing	118·11	299·95	105·29	226·39	196·80	227·91	170·76	228·61	179·24	286·77	135·44	32·40	65·20
O'Brien	61·15	67·85	52·02		63·96	31·25	69·39		107·70	107·32	31·52	245·73	2,673·40
Penn Canadian†								29·69		31·25	64·79	86·69	1,869·27
Peterson Lake‡											34·46	86·00	711·43
Provincial		22·22									191·63	30·95	126·35
Right of Way	38·86	32·59	43·73	38·30								241·34	432·97
Silver Queen							26·55	30·61	32·66				22·22
Timiskaming	41·88	98·86	85·67	65·87	197·64	95·52	61·83	62·85	50·58	96·51	66·12	31·25	243·24
Trethewey	17·62	54·80	48·14	26·50	60·37	77·26		70·35	27·65	66·25	58·00	43·98	31·25
												72·16	967·31
Totals	1,235·07	2,063·63	1,628·13	1,782·79	1,928·72	1,707·37	1,669·55	1,980·12	1,871·48	1,775·61	1,608·28	2,380·94	579·10
													21,631·79

*December shipments made by the General Mines Ltd., they having acquired this property.
The General Mines Ltd., is operating the Red Rock, Ruby, Cobalt Contact, and the Agannico (formerly Timiskaming Cobalt).
†Formerly the Cobalt Central.
‡Seneca Superior Lease.

CONCENTRATION.

The reducti n of low grade ores at Cobalt plays a more important part each year in the history of the district. Thus the year 1912 reached a new record, the mills having treated a total of 455,516 tons. With the enlargements either planned or already accomplished at the Northern Customs, Beaver, McKinley-Darragh, Cobalt Lake, and Casey mills, 1913 bids fair to show further substantial increases.

During 1912 the Penn-Canadian mill, formerly known as the Cobalt Central, was reopened, and the new mills of the Beaver, Nipissing, and Casey were put into commission.

The high grade mill of the Nipissing operated steadily during the year, and the Buffalo completed a similar mill and started operations towards the end of the year.

Mills and mines.	Tons milled.	Concentrates.			Concentration ratio.
		Jigs.	Tables.	Total.	
Beaver	14,602·0	113·4	129·3	242·7	60·1
Buffalo	51,900·0	.....	.....	1,242·2	42·1
Casey Cobalt	1,585·0	.....	43·2	43·2	36·1
Cobalt Lake	23,410·4	182·2	477·3	659·5	36·1
Colonial	7,692·0	.....	.....	86·0	89·1
Coniagas	52,797·5	253·0	919·0	1,172·0	45·1
Hudson Bay	21,599·0	177·0	453·0	630·0	34·1
King Edward	9,895·5	65·7	200·0	265·7	37·1
City of Cobalt—					
McKinley Darragh	51,897·0	516·9	1,406·4	1,923·3	22·1
Nipissing Reduction—					
Cobalt Lake	1,803·4	62·7	16·8	79·5	23·1
Green Meehan	795·5	7·3	6·9	14·2	56·1
Nipissing	14,251·0	87·0	97·5	184·5	78·1
Silver Queen	219·8	2·8	1·6	4·4	50·1
Northern Customs—					
Drummond	3,427·0	.....	111·1	111·1	31·1
LaRose	33,984·0	.....	1,210·5	1,210·5	28·1
Townsite	27,898·0	.....	1,074·0	1,074·0	26·1
Penn Canadian—					
Penn Canadian	5,400·0	.....	.....	95·3	57·1
Hargraves	546·0	.....	.....	4·2	130·1
Timiskaming	40,056·0	280·7	609·3	890·0	45·1
Trethewey	26,863·9	159·6	435·1	594·7	45·1
Total	390,473·0	.....	.....	10,527·0	37·1

Cyanide mills.	Tons.	Ozs. bullion produced.
Dominion Reduction		
Crown Reserve	15,704·0	346·234
Kerr Lake	5,963·0	130·675
Nipissing	3,447·0	57·875
O'Brien	39,909·5	229·360
	65,043·5	763·544

Total tons milled by water concentrating mills	390,473·0
Total tons milled by cyanide mills	65,043·5
Total tons milled, 1912	455,516·5

Dominion Reduction Mill.

This mill, which was formerly known as the Nova Scotia mill, recommenced operations, and is now working steadily on ores from the Crown Reserve and Kerr Lake. The amalgamating pans formerly used are to be replaced by a tube-mill, the discharge from which will go to agitators for the fine ground concentrate product for separate cyanidation, and no residues will be shipped to the smelter.

Buffalo Mill.

The concentrates from this mill are now treated in the Company's high-grade mill. Besides this, the cyanide plant recovered 100,224 ounces silver from the slimes treated.

O'Brien Mill.

This mill produced and shipped 313 tons of concentrates, which contained 229,271 ounces silver, and also recovered in their cyanide plant 229,360 fine ounces silver, valued at $141,765.

Nipissing Low Grade Mill.

This new mill did not start operations until late in the year, which will explain the small quantity treated. The 116 tons of concentrates made were sent to the high grade mill for treatment, and the amount of silver recovered by cyaniding the remainder was 57,875 ounces, valued at $35,882.

The only mill idle in the camp at the end of the year was the Silver Cliff, and this was reopened early in 1913.

High Grade Mill, Nipissing Mining Company.

Owing to the great complexity of the high-grade silver ores of the Cobalt district, and particularly on account of their high arsenic contents, they have

always been considered undesirable ores by the ordinary custom smelter. A heavy smelting charge was consequently exacted by the smelters for their treatment.

Experiments were carried on by the Nipissing Mining Company for a considerable length of time in an endeavour, if possible, to find some method of treating the ore in the district so that the final product to be shipped out should be refined silver bullion. A simple and effective process was finally worked out by Charles Butters, assisted by G. H. Clevenger. The plant, which was designed and constructed by James Johnston, commenced operations February 1, 1911, and has run successfully ever since.

High Grade Mill, Buffalo Mines, Limited.

During the summer the Buffalo Mines erected a mill for the treatment of their high grade ore and concentrates, and the mill commenced operations at the end of November. The method of treatment adopted is very similar to that already in operation at the Nipissing high grade mill.

By December 31, 1912, this mill had treated 105 tons of concentrates, along with metallics, precipitates, and resmelted bullion, producing 205,302 ounces of fine silver bullion.

Sampling.

The Campbell and Deyell customs sampling works at Cobalt operated continuously during the year. For the twelve months ending September 30, 1912, 5,604 tons of ore, containing 12,655,450 ounces of silver, were sampled in these works. During the same period about 100 tons of gold ore were sampled.

The ore is crushed in a Krupp ball mill, fitted with 8-mesh screens. All metallics coarser than this mesh remain in the mill and are subsequently removed and melted down to bullion. The pulp can then be sampled with a reasonable degree of accuracy. The ground ore is divided into quarters, and each quarter sampled down separately by machines to $\frac{1}{1000}$ of its bulk. These samples are then ground to pass 100-mesh, and divided into the requisite number of packets.

Freight Rates.

Shipments are billed at the highest rates, and charges are collected at destination accordingly. On presentation of paid expense bill, and signed assay certificate from the smelter, showing the value of the ore to be less than the rating of Group D of schedule, charges are adjusted in accordance with the valuation to the above rates. The smelter returns to the mine or owner, before deducting transportation charges, are the values used in determining the freight rates.

Smelting.

The shipments of Cobalt ores during 1912 were mostly treated by the same smelters as received the production of the previous year. In Canada the bulk of the output went to the

(1) Canadian Copper Company, Copper Cliff, Ont.
(2) Canada Smelting and Refining Company, Orillia, Ont.
(3) Conigas Reducti[illegible] Co[illegible] Thorold, Ont.
(4) Deloro Mining and [illegible] Company, Deloro, Ont.

A few consignments were also [illegible] three new plants which commenced operations during the year, viz.,

(5) Buffalo and Ontario Smelting and Refining Company, Kingston, Ont.
(6) Dominion Refineries, [illegible]
(7) Metals Chemical Compa[illegible], Welland, Ont.

Of the foreign shipments, all went to the United States with the exception of a few high grade shipments from the Crown Reserve mine to the Government of Saxony. The American smelting companies in this market were the

(8) American Smelting and Refining Company, at their works at Perth Amboy, Omaha, and Denver, and
(9) The Pennsylvania Smelting Company, Carnegie, Pa.,

while occasional consignments were taken by the

(10) Balbach Smelting and Refining Company, Newark, N.J., and the
(11) United States Metals Refining Company, Chrome, N.J.

As most of the Canadian plants produce refined cobalt oxide, the disorganized state of the market for this material has made it impossible at times to profitably dispose of their output, and they, therefore, welcomed a betterment of the market towards the end of the year.

When the smelters started treating Cobalt ores, cobalt oxide was selling at $2.50 per pound, but the consumption was so limited that the production from the Cobalt district soon glutted the market. Now the retail price quoted in New York is about 90 cents per pound, with an import duty of 25 cents per pound. It is selling in England and Europe at from 2s. 3d. to 3 shillings per pound, or about 68 cents, and the price paid to the smelters is necessarily still lower.

The Canadian smelters now supply practically the entire world's market with cobalt oxide of excellent grade, and if new uses are found for cobalt they are ready to increase the output and supply the demand.

The Canadian Copper Company decided to close down its Cobalt plant and received its last shipment of cobalt ore towards the end of October. Since that

time operations have been continued simply as a final clean-up to recover the values tied up in ore on hand, residues, furnace bottoms, etc.

The small smelting plant at North Bay is bidding for ore, rich in cobalt and low in silver.

The smelting schedules were practically unchanged from those in effect in 1911

The ores shipped to the smelters will average about 4,080 ounces silver per ton, between the limits of 75 ounces and 7,000 ounces. A few exceptional shipments are known to have assayed even above this latter figure, the highest shipment recorded being one of 20 tons from the Crown Reserve mine, which assayed 8,903 ounces silver per ton.

A number of the shipping mines at Cobalt have published annual reports, some details of the operations from which the following extracts have been taken:—

Beaver Consolidated Mines, Limited.

Year ending February 28, 1913.

Following is the record of development and stoping for the year: drifting, 3,441·5 feet; cross-cutting, 711·5 feet; sinking, 185·5 feet; raising, 157 feet; total, 4,501·5 feet.

During the year two levels have been added to the property, making ten in all. The main shaft is now down to a depth of 730 feet, but the last station is cut at 700 feet, leaving a 30 ft. sump in preparation for resuming sinking.

Mill.—The concentrating mill which has been in operation for practically a year has given such good results that it was deemed advisable to increase the capacity, and we are now milling close to 100 tons daily, instead of 50. While the mill was constructed more especially to treat the big dump which had accumulated, it might be noted that the underground development has been so productive of milling ore that the dump remains almost intact. Mill report, March 15, 1912, to February 28, 1913: ore milled, 17,842 tons; concentrates produced, 289 tons; silver in concentrates, 278,511·69 ounces. Net profit, exclusive of all milling and marketing costs, $123,655.94. The heads averaged 21·48 ounces and the tails 3·9 ounces, giving an extraction of 81·8 per cent.

The Buffalo Mines, Limited.

Year ending April 30, 1913.

Drifting, total	1,762 feet for the year.
Raising, increase	30 "
Station cutting, total	25 "
Total shaft work to date	1,074 "
Total drifting	11,947 "
Total stoping	1,597,572 cubic feet.

Mill.—The mill treated, during the year, 55,783 tons, averaging 45·83 ounces of silver per ton, or a total of 2,556,403 ounces treated, of which 82·64 per cent was recovered as follows: 39,798 ounces in amalgams; 982,697 ounces in jig concentrates; 1,090,189 ounces in table concentrates; or a total of 2,122,684 ounces recovered by concentration.

The new amalgamation plant and refinery were put in commission the latter part of November, 1912.

Cobalt Lake Mining Company, Limited.

Year ending December 31, 1912.

During the year the concentrator was operated 312 days, and crushed 23,410·4 tons of ore, containing an average silver content of approximately 28 ounces per ton. From this has been produced 864·1 tons of concentrates, containing 541,570·5 ounces of silver. This figure is based on smelter returns except for two cars for which the mine estimate, arrived at by daily sampling, was used. Total cost of mill operation and maintenance for the year is $12,845.46, or $1.83 per ton. This includes cost of assay office.

Mining.—Drifting, 1,319·4 feet; cross-cutting, 1,885·6 feet; raising, 90 feet; winzes, 101 feet; shaft sinking, 68 feet; total for year, 3,467 feet. Total to January 1, 1913, 9,749·18 feet.

The Coniagas Mines, Limited.

Year ending October 31, 1912.

The total silver shipments from this mine during the past year amount to 3,508,377·27 ounces, which was contained in 650 tons of mine ore, and 1,287 tons of concentrates. This ore was mined and concentrated at the mine at a net cost of 8·515 cents per ounce, which is an exceedingly low figure, as it includes head office expenses and royalties, and all expenses exclusive of shipping, smelting, refining, and marketing charges, which amounted to 4·445 cents per ounce of silver. The average price received per ounce of silver was 59·39 cents, as compared with 57·175 cents for the previous year.

The total tonnage of ore milled was 53,627, or an average of 2·86 tons per stamp per 24 hours. There were 803·3 tons high grade concentrates shipped and 484·2 tons of low grade slimes. The heads to the mill average 34·12 ounces per ton.

The sand tailings from the mill average 4·12 ounces per ton, and the slime tailings, 7·29 ounces per ton. They are stacked separately on the Company's property.

Work done during the year:—

Drifting, 2,773 feet; cross-cutting, 1,401 feet; winzes, 112 feet; raises, 298 feet.

Crown Reserve Mining Company, Limited.

Year ending December 31, 1912.

Mine development for year:—

Sinking and raising	432	feet.
Drifting	1,973	"
Cross-cutting	2,184	"
Total	4,589	"
Total to date	16,798	"

Concentration.—During the year the Nova Scotia Mining Company went into liquidation, the plant and equipment being taken over by the Dominion Reduction Company, with which Company the Coniagas Mines, Limited, renewed their contract for the treatment of their milling ore.

The results of concentration for the year are as follows:—

Tons milled	15,704
Ounces of silver returned	336,233
Ounces per ton	21·41
Total cost per ton	$4.39
Cost per ounce	19·92 cents.

The Hudson Bay Mines, Limited.

Year ending August 31, 1912.

Average assay of shipments:—

High grade ore, 3,431·6 ounces silver per ton.
Concentrates, 855·73 ounces silver per ton.

The total number of ounces of silver produced during the year was 957,055·47, the gross value of which was $561,992.80. The total cost of production was $143,061.90, or 14·948 cents per ounce of silver.

During the year 13,939·2 tons of low grade ore were sent to the concentrator from the mine, and 7,500 tons were taken from the dumps, making a total of 21,439·2 tons of ore run through the crushers, or 21,221·5 tons treated by the stamps. This ore was concentrated to 721·2 tons, carrying approximately 617,155·7 ounces of silver, the ratio of concentration being approximately 30 into 1.

High grade ore to the amount of 99·05 tons was produced by the mine, carrying approximately 339,899·60 ounces of silver.

Development During Year.—Drifting, 1,195·8 lineal feet; cross-cutting, 1,653·9 lineal feet; total, 2,849·7 lineal feet.

Average cost of drifting, 10·04 cents per foot; average cost of cutting, 10·38 cents per foot.

Kerr Lake Mining Company.

Year ending August 31, 1912.

Production of silver by this operating company for the year amounted to 1,855,495 ounces. Of this, 1,741,804 ounces were produced from high grade, and 113,691 ounces from milling ore which was sent to customs mill for treatment.

The average price which the Company received for its silver for the year was 60 cents per ounce. The total cost of production per ounce of silver was 18·3 cents, made up as follows:—

Mining cost	12·1	cents.
Shipment and treatment	5·55	"
Administration and general	0·65	"

This is higher than last year on account of smaller production, and the necessity of obtaining ore from narrow veins.

La Rose Consolidated Mining Company.

Year ending December 31, 1912.

Summary of Results.—The year's work has resulted in a profit of $1,023,142.54, derived from the production of 2,816,597 ounces of silver.

The price received for silver was 61·66 cents per ounce, compared with 53·55 cents per ounce received in 1911. This increase of 8·11 cents per ounce was largely offset by an increase of 6·73 cents per ounce in the cost of production. The latter is due to the fact that more development work was done than ever before, and that while the amount of ore produced was practically the same, the average grade of the high grade ore dropped from 1,731 ounces to 1,307 ounces per ton.

The McKinley-Darragh-Savage Mines of Cobalt, Limited.

Calendar year 1912.

McKinley Mine.—Drifting, 3,085 feet; cross-cutting, 1,819 feet; raising, 332 feet; winzes, 100 feet; total footage, 5,336 feet; stoping, 31,801, broken.

Mill Report.—Total ore treated, 51,897 tons; average tons per day, 161·70; mill heads, 32·73 ounces; mill tails, 4·16 ounces; ounces of silver recovered, 1,489,514.

Savage Mine.—Drifting, 1,621·5 feet; cross-cutting, 1,345·5 feet; raises, 300·5 feet; winzes, 67·5 feet; shafts, 85 feet; total footage, 3,420 feet; stoping, 10,791·5 tons broken.

Sorting mill tons treated, 17,888; average tons treated per day of ten hours, 57·33; cost per ton milled, $0.469; cost per ounce recovered, $0·0133.

Nipissing Mines Company.

Calendar year 1912.

High Grade Mill.—The plant for the treatment of high grade ore ran successfully throughout the year, and treated 1,752 tons of Nipissing ore, averaging 2,212 ounces per ton; and 90 tons of custom ore. Bullion shipped amounted to 4,258,641 ounces.

A sampling plant was added and a blast furnace was installed in the refinery for the reduction of slags, flue dust, and precipitate. A new reverberatory furnace has also been built for the refining of the precipitate from the low grade mill, so that practically the entire silver product of the mine is now shipped as bullion over 997 fine.

Low Grade Mill.—The cyanide plant erected for the treatment of the low grade ores was completed in 1912, and is now in full operation. All the ore so far milled has come from the town side, being transported across the lake and to the top of the picking belt by an aerial tramway.

The first-class ore and the concentrate produced by the picking belt are sent to the high grade mill for treatment. The discard and tailing from the picking plant are transferred to the crushing department of the main mill.

Surface Prospecting.—No trenching was done during 1912; this gave way to surface prospecting by the hydraulic plant installed during the previous season. Pressure is obtained by a turbine pump situated on the shore of Cobalt lake. It throws 1,800 gallons of water per minute under a head of 415 feet at the pump, and is directly connected to a 650 H.P. high-speed motor.

The plant started operations on May 8 and ran without serious interruption until November 29—sixteen hours per day. The operation consists in removing the soil and boulders by a powerful jet of water, thereby plainly exposing the surface of the rock when any veins outcropping can be easily seen.

During the season, 33·2 acres of ground were cleared, the average depth of soil was 1·75 feet, a 3½" or 4" nozzle was used, the average pressure being 121 pounds at the nozzle. The area cleared had been trenched in previous years, but a great many additional small veins and stringers were exposed by the hydraulic operation.

British Columbia.

The chief sources of the silver production in this Province are the silver-lead ores of East and West Kootenay, supplemented by the silver contained in the gold-copper-silver ores of Rossland, Boundary, and Coast districts. The production in 1912, based on smelter recoveries, was 2,651,002 ounces, valued at $1,612,737.

The leading silver producers among the silver-lead mines of the Province, in order of importance, are the Standard, Van Roi, Sullivan, Molly Gibson, and Rambler-Cariboo.

The Granby mines at Phoenix, on account of their large tonnage of copper ores, come fourth as silver producers, with the others retaining their relative positions.

The past year witnessed an increased production from the Slocan district, chiefly from Sandon and Silverton camps, with Ainsworth coming to the front. The newest promising camp is Hazelton, from which the opening of 1913 witnessed several shipments.

The following table is taken from the annual report of the Minister of Mines for British Columbia, 1912, and being a record of mine production the figures are somewhat higher than those showing production based on smelter recoveries:—

SILVER.—TABLE 3.

Production in British Columbia by Districts, 1908-1912.*

——	1908.	1909.	1910.	1911.	1912.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
Cassiar	14,169	4,569	1,454	29,976	5,868
Kootenay, East—					
Fort Steele division	641,855	580,240	501,475	330,235	376,918
Other divisions	3,384	825	243		7,405
Kootenay, West—					
Ainsworth division	314,142	352,555	233,010	77,375	301,755
Nelson "	25,067	75,908	45,787	76,774	164,182
Slocan "	848,595	738,175	964,634	793,926	1,657,105
Trail Creek "	129,558	80,026	87,833	88,076	87,530
Other divisions	173,675	169,435	107,753	67,884	43,536
Yale—					
Boundary	451,323	492,333	460,945	326,849	389,341
Yale	23	.....	3	343	.....
Coast and other districts	29,598	38,676	47,104	100,926	98,468
Total	2,631,389	2,532,742	2,450,241	1,892,364	3,132,108

* From the Minister of Mines Reports, British Columbia.

Yukon.

The figures of silver production of the Yukon, given in Table 2, represent the silver alloyed with the placer gold, together with a small amount from the lode mines of the district. On an average, about one ounce of silver is contained in each five ounces of crude bullion from the alluvial workings. In 1909, the production was 45,000 ounces of silver, all from the placer mines. In 1910 the placer production was 50,000 ounces, valued at $26,743, and the lode production, 37,418 ounces, valued at $20,013, or a total of 87,418 fine ounces, valued at $46,756. In 1911 the placer production was 50,300 ounces, valued at $26,812, and the lode production, 62,408 ounces, valued at $33,266, a total of 112,708 fine ounces, with a value of $60,078. In 1912 the placer production was 60,302 ounces, valued at $36,685, and the lode production, 20,766 ounces, valued at $12,633, a total of 81,068 ounces, with a valuation of $49,318.

Exports.

The following table shows the statistics of silver contained in ore, matte, or other form, exported from Canada since 1886, as compiled from the reports of Trade and Navigation published by the Customs Department. The exports during 1912 were 34,911,922 ounces, valued at $19,494,416, as against exports of 31,216,725 ounces, valued at $15,807,366, in 1911.

SILVER.—TABLE 4.

Exports of Silver in Ore, etc.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1886	25,957	1895	994,354	1904	1,904,394
1887	206,284	1896	2,271,959	1905	2,777,218
1888	219,008	1897	3,576,391	1906	5,686,444
1889	212,163	1898	2,902,277	1907	9,941,849
1890	204,142	1899	1,623,905	1908	12,403,482
1891	225,312	1900	2,341,872	1909	15,719,909
1892	56,688	1901	2,026,727	1910	15,649,537
1893	213,695	1902	1,820,058	1911	15,807,366
1894	359,731	1903	1,989,474	1912	19,494,416

ZINC.

The production of zinc ore in Canada in 1912, as obtained by direct returns from the producers, was 6,415 tons, valued at $215,119, the greater part being from British Columbia. The zinc content of these shipments was returned as 5,354,700 pounds, which, if valued at the average New York price of spelter during the year, would be worth $371,377.

The ore shipped from British Columbia contains also a varying silver content, for which payment is made by the smelters, and without which, on account of the import duty to United States and the long rail haul, it would not, in many cases, pay to ship.

A small trial shipment of 10 tons of ore was made from Ontario for testing purposes.

The British Columbia shipments were heavy, as a result of the activity in Slocan mines and mills. This ore is exported for treatment to Kansas and Oklahoma smelters, and since the smelters demand over 30 per cent. the maximum rate of the United States customs tariff affects Canadian ores.

The present schedule of the tariff on zinc is as follows:—

Ores containing less than 10 per cent, free of duty.

Ores containing 10 per cent or more and less than 20 per cent, ¼ cent per pound.

Ores containing 20 per cent or more and less than 25 per cent, ½ cent per pound.

Ores containing 25 per cent or more, 1 cent per pound.

All rates being based on the metallic contents of the zinc.

The proposed new tariff may make a change in the rate on zinc ores.

The United States smelters usually pay on a basis of 45 per cent zinc content. The base price varies with the price of spelter at St. Louis, and a stated amount is added or deducted for every unit of zinc in excess of, or less than, the base. The silver is settled for at the New York price, after making deductions for loss in treatment. Limits are frequently set which lead or iron contents may not exceed. Thus zinc shipments are subject to the following penalties:—

(1) Freight, the long haul to the United States smelters.

(2) Duty on zinc in ore or concentrates, 1 cent per pound on metallic zinc content.

(3) Duty on lead contained in ore though not paid for by smelters, 1½ cents per pound on all lead contained.

(4) Payments. Deduction of six ounces of silver per ton, 75 per cent on the balance paid for.

The payment on zinc in ore is equivalent to about 63½ per cent of zinc content, at final market price of spelter, in some cases.

During 1912 there were received at American smelting works, 7,190 tons of zinc ore, containing 6,392,983 pounds of zinc, 199,955 ounces of silver, 33,812 pounds lead. A large part of this was not smelted during the year, but was stocked.

The imports of zinc, taken as an index of consumption, show a fairly steady increase. The total imports of zinc in blocks and pigs and spelter were, in 1880, some 744 tons; in 1889 they had risen to 1,127 tons, and remained fairly stationary until about 1899, in which year the imports were 1,213 tons. In the fiscal year ending March, 1909, they had risen to 4,610 tons, and for the calendar year 1911, the total imports were 7,534 tons, in addition to which there were 4,269 tons of zinc white, and zinc manufactures to the value of $30,862.

For the calendar year 1912, the total imports were 10,897 tons, in addition to which there were 5,253 tons zinc white, zinc manufactures to the value of $16,336; also zinc dust, 154 tons, valued at $18,941; and sulphate and chloride of zinc, 171 tons, valued at $29,104.

Statistics of the production and imports of zinc, and the average monthly prices of spelter on the New York and London markets for two years, are given in the accompanying tables.

ZINC. TABLE 1.

Annual Production of Zinc.

Calendar Year.	Zinc ore shipped.		Metallic zinc in ore shipped.	
	Tons.	Spot value.	Lbs.	Final value.
		$		$
1898	1,162	11,000	788,000	36,011
1899	865	18,165	814,000	46,805
1900	261	4,810	212,000	9,342
1901	.....	.....	.....	.....
1902	158	1,659	342,200	6,882
1903	1,900	10,500	900,000	48,660
1904	597	3,700	477,568	24,256
1905	9,413	139,200	*	*
1906	1,154	23,800	*	*
1907	1,573	49,100	*	*
1908	452	3,215	*	*
1909 (a)	18,371	242,399	16,468,204	906,245
1910	5,063	120,003	4,361,712	240,766
1911	2,590	101,072	2,346,848	135,132
1912	6,415	215,149	5,354,700	371,777

* Figures not available.
(a) Includes 7,424 tons shipped late in 1908.

ZINC.—TABLE 2.

Imports of Zinc in Blocks, Pigs, and Sheets.

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
		$			$			$
1880	13,805	67,881	1891	17,984	105,023	1902	34,871	141,569
1881	20,920	94,015	1892	21,881	127,302	1903	26,616	142,827
1882	15,021	76,631	1893	26,446	124,360	1904	25,553	138,057
1883	22,765	94,799	1894	20,774	90,680	1905	25,141	141,514
1884	18,945	77,373	1895	15,061	63,373	1906	21,462	158,438
1885	20,954	70,598	1896	20,223	80,784	1907 (9 mos.)	18,427	126,221
1886	23,146	85,599	1897	11,946	57,754	1908	30,362	191,081
1887	26,142	98,557	1898	35,148	112,785	1909	26,222	141,066
1888	16,407	65,827	1899	18,785	107,477	1910	35,040	201,777
1889	19,782	83,935	1900	28,748	156,167	1911	34,659	206,746
1890	18,236	92,530	1901	20,527	103,457	1912	33,379	213,141

ZINC.—TABLE 3.

Imports of Spelter.*

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
		$			$			$
1880	1,073	5,301	1891	6,249	31,459	1902	18,356	80,757
1881	2,904	12,276	1892	13,909	62,550	1903	23,159	110,817
1882	1,654	7,779	1893	10,721	49,822	1901	33,952	164,751
1883	1,274	5,196	1894	8,423	35,615	1905	37,941	206,244
1884	2,239	10,417	1895	9,249	30,245	1906	50,137	290,686
1885	3,325	10,875	1896	10,897	40,548	1907 (9 mos.)	42,465	269,044
1886	5,432	18,238	1897	8,342	32,826	1908	65,593	314,369
1887	6,908	25,007	1898	2,794	13,561	1909	55,981	310,688
1888	7,772	29,762	1899	5,452	29,687	1910	132,001	658,285
1889	8,750	37,403	1900	5,836	29,416	1911	98,372	505,447
1890	14,570	71,122	1901	14,621	58,283	1912	125,721	716,064

* Spelter in blocks and pigs.

ZINC.—TABLE 4.

Imports of Zinc, Manufactures of.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	8,327	1891	7,178	1902	6,683
1881	20,178	1892	7,563	1903	9,754
1882	15,526	1893	7,464	1904	12,682
1883	22,599	1894	6,193	1905	11,912
1884	11,952	1895	5,581	1906	12,917
1885	9,459	1896	6,290	1907 (9 mos.)	12,556
1886	7,345	1897	5,145	1908	19,240
1887	6,561	1898	10,503	1909	15,621
1888	7,402	1899	14,661	1910	15,495
1889	7,233	1900	11,475	1911	24,128
1890	6,472	1901	6,882	1912	34,010

1912	Zinc seamless drawn tubing	Duty free	$		
	" manufactures of, N.O.P.	25%	$	34,010	
	Total		$	34,010	

World's Production of Spelter in Short Tons.*

Country.	1907.	1908.	1909.	1910.	1911.	1912
Australia	1,098	1,198	.....	560	1,904	2,531
Austria and Italy	12,522	14,083	13,031	14,666	18,607	21,050
Belgium	170,307	181,851	184,194	190,233	215,050	220,600
France and Spain	61,438	61,512	61,859	65,191	70,791	79,442
Germany—						
Rhine district	77,459	80,670	82,863	86,823	276,008	268,810
Silesia	152,611	158,328	150,731	154,596		
Great Britain	61,286	60,029	65,422	69,531	73,803	63,090
Holland	16,526	19,017	21,548	23,121	25,059	26,382
Poland	10,735	9,740	8,758	9,514	10,952	12,320
United States	249,860	210,421	255,760	260,184	286,526	338,806
Total	813,812	796,832	854,066	883,419	978,695	1,063,121

* Mineral Resources of the United States.

World's Consumption of Spelter in Short Tons.*

Country.	1907.	1908.	1909.	1910.	1911.	1912.
Austria-Hungary	34,171	35,925	36,155	37,258	47,950	.....
Belgium	60,627	74,936	68,343	86,531	71,539	.....
France	76,720	85,956	73,744	61,049	90,389	.....
Germany	192,792	198,580	207,232	196,209	244,490	.....
Great Britain	154,653	152,627	171,408	195,989	193,674	.....
Holland	4,189	4,188	4,409	4,409	4,409	.....
Italy	7,496	9,257	9,039	8,929	11,133	.....
Russia	19,290	19,946	20,282	27,447	32,518	.....
Spain	5,180	5,290	4,850	4,749	4,861	.....
United States	15,228	11,020	6,614	13,228	17,857	.....
Other countries	226,969	214,167	270,730	245,884	280,059	.....
Total	795,315	811,892	872,806	882,573	998,979	.....

* Mineral Resources of the United States.

Average Price of Spelter in Cents per Pound at New York.*

Month.	1902.	1903	1904.	1905.	1906.	1907.	1908.	1909.	1910	1911	1912.
January	4·27	4·865	4·863	6·190	6·487	6·732	4·513	5·141	6·101	5·452	6·442
February	4·55	5·043	4·916	6·139	6·075	6·814	4·785	4·889	5·569	5·518	6·499
March	4·28	5·349	5·057	6·067	6·209	6·837	4·665	4·757	5·037	5·563	6·626
April	4·37	5·550	5·219	5·817	6·087	6·687	4·645	4·965	5·439	5·399	6·633
May	4·47	5·639	5·031	5·434	5·997	6·441	4·608	5·124	5·191	5·348	6·679
June	4·96	5·697	4·760	5·190	6·096	6·419	4·543	5·402	5·128	5·520	6·877
July	5·27	5·662	4·873	5·396	6·006	6·072	4·485	5·402	5·152	5·695	7·116
August	5·44	5·725	4·866	5·706	6·027	5·701	4·702	5·729	5·279	5·953	7·028
September	5·49	5·686	5·046	5·887	6·216	5·236	4·769	5·796	5·514	5·869	7·451
October	5·38	5·510	5·181	6·087	6·222	5·430	4·801	6·199	5·628	6·102	7·426
November	5·18	5·038	5·513	6·145	6·375	4·925	5·059	6·381	5·976	6·380	7·371
December	4·78	4·731	5·872	6·522	6·593	4·254	5·137	6·249	5·624	6·301	7·162
Year	4·84	5·40	5·100	5·822	6·198	5·962	4·726	5·503	5·520	5·758	6·943

* From the statistical publication of the Metallgesellschaft, etc., of Frankfort-on-the-Main, Germany.

Average Prices of Spelter, Ordinary Brands, in London.*

Month	1903.			1904.			1905.			1906.			1907.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	20	0	8	21	11	2	24	19	9	28	8	2	27	7	1
February	20	15	4	21	16	5	24	10	6	26	2	4	26	1	5
March	22	18	2	21	19	6	23	13	6	24	15	3	26	4	8
April	22	8	7	22	5	1	23	14	3	25	19	3	25	17	5
May	21	2	4	22	2	10	23	11	8	27	0	2	25	14	2
June	20	8	2	21	14	6	23	16	8	27	9	9	24	10	2
July	20	8	5	22	2	9	23	19	6	26	15	11	23	18	11
August	20	9	5	22	7	6	24	14	6	27	0	5	23	1	7
September	20	17	7	22	11	5	26	8	3	27	12	5	21	0	4
October	20	9	4	23	1	7	28	1	7	27	18	10	21	12	14
November	20	14	7	24	12	9	28	5	11	27	15	1	21	8	4
December	20	19	10	24	17	1	28	14	11	27	19	3	20	3	3
Year	20	19	5	22	11	10	25	7	7	27	1	5	23	16	9

Month	1908.			1909.			1910.			1911.			1912.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	20	6	3	21	6	3	23	4	3	23	16	9	26	9	11
February	21	0	7	21	8	9	23	3	1	23	3	10	26	6	5
March	21	1	5	21	8	8	23	0	7	22	19	2	25	19	11
April	21	6	1	21	10	1	22	9	11	25	13	8	25	8	10½
May	20	2	10	21	19	.	22	1	1¼	24	6	1	25	11	2
June	19	2	2	21	19	11	22	3	2	24	9	7	25	11	11
July	18	14	1	21	18	9	22	5	6	24	13	10½	25	13	½
August	19	6	9	22	0	3	22	14	0	26	11	1½	26	1	2
September	19	10	2	22	17	1	23	2	7½	27	12	6½	26	17	..
October	19	15	1	22	3	4	23	16	6½	27	4	10	27	5	10
November	20	17	1	23	2	1	24	1	9	26	13	1¼	26	14	3
December	20	19	2	23	1	3	23	17	7½	26	13	6½	26	..	4
Year	20	3	5	22	3	..	23	0	0	25	3	2	26	3	4

* From the annual publication of the Metallgesellschaft, etc., of Frankfort-on-the Main, Germany.

MISCELLANEOUS METALLIC MINERALS.

ALUMINIUM.

No commercial ores of aluminium have as yet been found in Canada. Aluminium is, however, made in extensive works at Shawenegan Falls, Quebec, from bauxite ore imported from France, Germany, and the United States by the Northern Aluminium Company. A wire mill for the manufacture of aluminium wire and cables is also operated by the same firm.

There being but one firm engaged in the manufacture of aluminium, we are precluded from publishing statistics of production.

Imports of alumina which probably include bauxite and exports of aluminium are, however, published in the reports of the Department of Customs.

During the twelve months ending December 31, 1912, the imports of alumina were 22,400,600 pounds, or 11,200 tons, while the exports of aluminium in ingots, bars, etc., during the same period, were 18,285,700 pounds, or 9,143 tons, besides manufactures of aluminium, valued at $10,898. The imported alumina was valued at 2 cents per pound, and the exported aluminium at 10.9 cents.

The imports of alumina and exports of aluminium during the past nine years are shown in tabular form, as follows:—

Annual Imports of 'Alumina' and Exports of Aluminium.

Calendar Year.	Imports of alumina.		Exports of aluminium.		
			Ingots, bars, etc.		Manufactures
	Lbs.	Value.	Lbs.	Value.	Value.
		$		$	$
1905	5,360,800	138,765	2,535,386	508,219	1,588
1906	8,975,400	239,136	4,521,486	889,113	2,244
1907	12,705,300	268,502	5,478,203	1,109,353	1,489
1908	1,485,500	29,752	1,713,800	399,785	1,727
1909	11,794,100	234,544	6,134,500	918,195	3,453
1910	19,464,400	403,283	7,722,400	1,160,242	3,741
1911	18,907,200	372,009	4,990,100	747,587	1,555
1912	22,400,600	448,061	18,285,700	2,002,363	10,898

Prices.—The price of aluminium, No. 1, ingots in New York during 1912 varied between the limits of 18¾ and 27 cents per pound; during 1911 the price varied between 18¾ and 22 cents per pound; while 20 to 22 cents per pound were paid during 1910.

In Europe, prices for aluminium for several years have been considerably lower than in the United States.

In 1909 the prices per pound at works in Europe are reported by the 'Metallgesellschaft' as having ranged from 13½ cents to 16 cents; in 1910, from 14 cents to 17¼ cents; and in 1911, from 11 to 13½ cents.

ANTIMONY.

The production of antimony in Canada has been not only small but spasmodic.

In 1907 the production was 2,016 tons of antimony ore shipped, valued at $65,000, and 63,850 pounds of refined antimony, valued at $5,108.

In 1908 customs returns showed an export of 148 tons of antimony ore, valued at $5,443.

In 1909, in addition to the shipment of 35 tons of concentrates, there were produced about 61,200 pounds of antimony metal, chiefly at the works of the Canadian Antimony Company, Limited, at Lake George, New Brunswick, a small recovery being also reported from the Consolidated Mining and Smelting Company's refinery at Trail, B.C.

The total production of antimony in 1910, as reported to this Branch, consisted of 364 tons of antimony concentrates, valued at $13,906, shipped from West Gore, Nova Scotia.

The auriferous antimony property at West Gore, formerly operated by the Dominion Antimony Company, Limited, was taken over in July, 1909, by the West Gore Antimony Company.

The mines and works of the Canadian Antimony Company, Limited, at Lake George, New Brunswick, have not been in operation since 1909.

In British Columbia, some of the lead ores contain a small percentage of antimony—about one-third of one per cent, and some refined antimony was recovered at Trail in 1907 and 1909, the recovery being somewhat irregular.

No production is reported in 1912, the West Gore Antimony Company not operating their mill, being engaged part of the year retimbering their shaft.

Annual Shipments of Antimony Ore.*

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	665	31,490	1905 (a)	527	...
1887	584	10,860	1906 (a)	782	...
1888	345	3,696	1907*	2,016	65,000
1889	55	1,100	1908 (b)	148	5,443
1890	263	625	1909*	35	1,575
1891	10	60	1910	364	13,906
1892 to 1897	Nil.	Nil.	1911	...	...
1898	1,344	20,000	1912	...	...
1899 to 1904	Nil.	Nil.			

(a) As recorded by the Nova Scotia Department of Mines: no value given.
(b) Exports.
* In addition to the shipments shown in the table, refined antimony was produced in 1907 to the extent of 63,850 pounds valued at $5,108, and in 1909, 61,907 pounds valued at $4,285.

Exports of Antimony Ore.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		£			£
1880	40	1,948	1899	67	190
1881	31	3,398	1900	219	3,141
1882	323	11,673	1901	10	1,645
1883	105	4,200	1902	280	13,658
1884	483	17,875	1903	33	4,332
1885	758	36,250	1904	160	7,237
1886	665	31,480	1905	525	27,118
1887	229	9,720	1906	420	17,061
1888	352	6,894	1907	1,727	37,807
1889	30	695	1908	48	5,113
1890	38	1,000	1909	1	120
1891	3	60	1910	339	14,095
1892 to 1897	Nil.	Nil.	1911	57	4,905
1898	1,232	15,295	1912	Nil.	Nil.

Imports of Antimony.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		£			£
1880	12,217	5,903	1897	131,661	8,031
1881		7,060	1898	146,451	12,350
1882	183,597	15,044	1899	289,066	16,851
1883	105,346	10,355	1900	186,997	20,001
1884	445,600	15,561	1901	350,737	24,714
1885	82,012	8,182	1902	504,822	39,275
1886	89,787	6,951	1903	868,146	65,434
1887	87,827	7,122	1904	118,913	27,112
1888	120,125	12,242	1905	186,151	12,828
1889	119,034	11,206	1906	403,918	56,297
1890	117,066	17,139	1907 (9 mos.)	321,385	71,193
1891	111,084	17,483	1908	484,899	66,484
1892	189,308	17,689	1909	144,254	32,133
1893	181,823	11,771	1910	563,602	40,681
1894	139,571	12,249	1911	640,208	42,234
1895	79,707	6,131	1912	533,517	35,462
1896	103,200	9,557			

				£
1912	Antimony, or regulus of, not ground, pulverized or otherwise manufactured	Duty free.	512,590	32,867
	Antimony salts	"	20,927	2,595
	Total		533,517	35,462

COBALT.

The silver-cobalt-nickel-arsenides of Coleman and adjacent townships, more familiarly known as the Cobalt district, in the Province of Ontario, are now the principal sources of the world's production of cobalt.

With respect to the greater part of the ore shipped in which silver is the chief constituent of value, the purchasing smelters make no allowance for cobalt content, and the mine owners, therefore, receive nothing for the cobalt.

The recovery of this metal in Canada, so far, has been confined to the production of cobalt oxide and mixed cobalt and nickel oxides by the Coniagas Reduction Company, and the Deloro Mining and Reduction Company. The Dominion Refineries, Limited, at North Bay, also entered the field in 1912. According to direct returns, there were produced during 1912, 349,454 pounds of cobalt and nickel oxides, and 1,285,280 pounds of cobalt material and mixed oxides of cobalt and nickel, the total value of all these products being $320,244.

No information is available as to the quantities recovered from ores shipped to smelters outside of Canada.

The following table shows the ore shipments, estimated cobalt content, and value received by the shippers for cobalt, as published by the Ontario Bureau of Mines:—

Year.	Ores shipped.	Estimated total cobalt content.	Per cent.	Value received by shippers for cobalt.
	Tons.	Tons.		$
1904	158	16	10·1	19,960
1905	2,144	118	5·5	100,000
1906	5,335	321	6·0	80,704
1907	14,788	739	5·0	104,426
1908	25,624	1,224	4·7	111,118
1909	30,677	1,533	5·0	94,965
1910	34,282	1,098	3·2	54,639
1911	26,653	852	3·2	170,890
1912	.....	.....	.....	.....

The production of cobalt has so largely exceeded the demand as to cause a very great fall in the price.

The price of cobalt oxide (78·6 per cent cobalt) in New York, during 1907, remained uniform at $2.50 per ton. In 1908 the price fell to $1.45 in April, and $1.40 in November. During the first three months of 1909, from $1.45 to $2.60 was quoted, after which the price again fell, quotations ranging from $1.10 to $1.75 until December. In the latter part of December there was a further falling off to prices ranging from 80 to 85 cents per pound.

During 1910 the price remained fairly constant at from 80 to 85 cents per pound, while in December, 1911, it fell to from 78 to 80 cents per pound.

With regard to present prices, the following quotation from the Weekly Report of the Department of Trade and Commerce, dated July 7, 1913, page 759, will be of interest:—

'Inquiries instituted in connexion with the recent application about the prospects of doing business in Europe in cobalt and nickel oxides and arsenic, indicate that such a considerable number of metal and chemical firms are interested in these products, that a memorandum is herewith included dealing with the current market conditions in these specialties which a leading firm in the trade has courteously supplied, and also authorized its publication for the benefit of Canadian producers likely to be interested.

'The European consumption of cobalt oxide is at present maintained almost entirely in the hands of certain interests working in conjunction with a syndicate composed of the principal European manufacturers of cobalt preparations. The selling price of this combination was, until recently, between 2s. 6d. and 2s. 9d. per pound, according to quantity, for black cobalt oxide guaranteed to contain not less than 70 per cent cobalt metal, and in other respects of good commercial quality. Within the last few weeks, however, a demand has been made to raise this price to a minimum of 3s. per pound. In view of the existence of a number of outside producers, it is considered unlikely that the syndicate will be able to maintain this advance.

'In addition to the black oxide of cobalt there is considerable outlet for the so-called "grey" or prepared cobalt oxide, containing approximately 76 per cent cobalt metal. This quality fetches a premium of 1d. to 3d. per pound on the black oxide.'

In the 'Statistique de l'Industrie Minerale en France et en Algerie' for 1911, the following statement is of interest: 'The production of cobalt ores, which was more than 2,360 metric tons in 1908, and then fell to 548 tons in 1909, was only 54 tons in 1910, and ceased completely in 1911.

'Thus New Caledonia, which for a long time enjoyed a veritable monopoly of cobalt ore, has been suddenly supplanted in these markets by Canada, as a result of the exploitation of the argentiferous-cobalt ores of the Cobalt district.'

In 1907 an Act was passed by the Ontario Legislature, authorizing the payment of bounties on certain nickel, cobalt, copper, and arsenic products, mined and refined in the Province. The Act and Amendment are quoted following:—

An Act to Encourage the Refining of Metals in Ontario.

Whereas, it is desirable to encourage the refining of nickel, cobalt, copper and arsenic ores within the Province;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as 'The Metal Refining Bounty Act.'

2. The treasurer of the Province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-Governor in Council, pay in each year to the refiners of the metals or metal compounds hereinafter specified, when refined in the Province from ores raised and mined in the Province, a bounty upon each pound of such metal or compound so refined as follows:—

Class 1.—On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel oxide; but nickel upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all $60,000 in any one year.

Class 2.—On refined metallic cobalt or on refined oxide of cobalt, 6 cents per pound on the free metallic cobalt or on the cobalt contained in the oxide of cobalt; but cobalt upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the cobalt products herein mentioned is not to exceed in all $30,000 in any one year.

Class 3.—On refined metallic copper or on refined sulphate of copper, 1½ cents per pound on the free metallic copper or on the copper contained in the sulphate of copper; or on any copper product carrying at least 95 per cent of metallic copper, one-half cent per pound; but copper upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the copper products herein mentioned is not to exceed in all $60,000 in any one year.

Class 4.—On white arsenic, otherwise known as arsenious acid, produced from mispickel ores and not from ores carrying smaltite or niccolite or cobalite, one-half cent per pound; but the amount to be paid as bounty on the arsenic compound herein mentioned is not to exceed in all $15,000 in any one year.

(1) Provided, however, that if so much of any of the above-mentioned classes of refined products is refined in the Province in any one year that the amount hereby set apart in respect of the said class would be insufficient to pay the bounties herein provided therefor, then the bounty payable to the refiners of such class of refined products shall abate and be payable upon a *pro rata* basis so that not more than the maximum amount herein specified for any of the said classes shall be paid in respect of said class in any one year.

(2) Provided, also, that the bounties herein provided for shall cease and determine with the payment of any sum or sums which shall have been earned during the period of five years from the passing of this Act.

(3) No person, firm or company shall be entitled to claim or receive any of the bounties in this Act provided for unless such person, firm or

company shall have been at all times prepared and ready and willing during the period for which the bounty is claimed, to smelt, treat and refine ores from which the same product as that on which the bounty is claimed can be produced, belonging to any other person, firm or company, at rate and on terms and conditions approved by the Lieutenant-Governor in Council, or shall have been ready to purchase such ores at rates approved by the Lieutenant-Governor in Council as current market rates.

An Act to Amend the Act to Encourage the Refining of Metals in Ontario.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. Subsection 2 of section 2 of The Metal Refining Bounty Act is amended by striking out the word 'five' where the same appears in the last line of the said subsection, and substituting therefor the word 'ten.'

MERCURY.

There has been no production of mercury since 1897. The small production reported in 1895 and 1897 was derived from the deposits at the western end of Kamloops lake, B.C. These deposits consist of quartz veins containing pockets of cinnabar. These veins are in a zone of decomposed volcanic rock of Tertiary age.

During 1911 and 1912 development work has been carried on by the Mercury Mines, Limited, at Seehart, Vancouver island. Some ore was taken out but has been piled on the dump for future treatment.

Production of Mercury.

Calendar Year.	Flasks. (76½ lbs.)	Price per flask.	Value.
		$ cts.	$
1895	71	33 00	2,343
1896	58	33 41	1,940
1897	9	36 00	324

Imports of Mercury.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$			$
1882	2,443	965	1893	50,711	22,998	1904	151,197	80,658
1883	7,110	2,991	1894	36,914	14,483	1905	103,330	48,112
1884	5,848	2,441	1895	63,732	25,703	1906	150,364	69,505
1885	14,490	4,781	1896	77,869	32,353	1907 (9 mos.)	98,368	45,602
1886	13,316	7,142	1897	76,058	33,534	1908	178,413	76,549
1887	18,409	10,618	1898	59,750	36,425	1909	92,220	46,217
1888	27,951	14,913	1899	103,817	51,695	1910	283,980	116,914
1889	22,931	11,814	1900	85,342	51,087	1911	128,980	74,956
1890	15,912	7,677	1901	140,610	94,564	1912 Duty free	106,958	60,943
1891	29,775	20,223	1902	97,283	56,615			
1892	30,936	15,048	1903	164,968	91,625			

MOLYBDENUM.

Although there are numerous occurrences of molybdenite in Canada, of more or less undetermined value, there has been very little production of the mineral.

In 1902, about 6,500 pounds of molybdenum, valued at $400, were reported as having been taken from a deposit in the township of Laxton, county of Victoria, by John Webber, of Toronto.

In 1903, Mr. A. W. Chisholm, of Kingston, reported the shipment to the United States, and elsewhere, of 85 tons of molybdenum ore, valued at $1,275, culled from about 500 or 600 tons of rock taken from the east half of lot 5, concession XIV, Sheffield township, Addington county.

Some work was done during 1912 in different parts of Quebec province, but there was no production of the mineral.

According to 'The Mineral Industry,' published in New York: 'The market for molybdenum ores is very narrow. The price fluctuates widely, and is generally subject to special negotiations at each particular sale. American buyers require concentrates to contain 90 to 95 per cent molybdenite, for which they will pay $400 to $450 per ton. The principal purchasers in the United States are: Electrometallurgical Company of America, New York; Primos Chemical Company, Primos, Penn.; DeGolia and Atkins, San Francisco, Cal. In Germany, Friedrich Krupp, of Essen, is a large user of molybdenum.'

During the year 1911 a report on the molybdenum ores of Canada was issued by the Mines Branch.[1]

[1] No. 93. Report on the Molybdenum Ores of Canada, by T. L. Walker, Ph.D., Mines Branch, Department of Mines, Ottawa, 1911.

PLATINUM AND PALLADIUM.

In past years the chief source of the platinum production in Canada was the placer gravels of British Columbia, principally in the Similkameen district. The nickel-copper ores of the Sudbury district also carry small quantities of the metals of the platinum group, and since 1902 considerable quantities of these metals have been recovered from the residues resulting from the treatment of the mattes from Sudbury.

Since 1906 no record of the recovery of metals of the platinum group from the Sudbury District ores has been published, but the International Nickel Company have been good enough to inform us that the recovery of gold, silver, platinum, and palladium at their works in New Jersey for the six years ending December 31, 1912, was as follows:—

Year.	Gold.	Silver.	Platinum.	Palladium.
	Ozs.	Ozs.	Ozs.	Ozs.
	993·572	63,400·70	226·800	607·300
1907	5,238·181	139,329·29	172 316	382·287
1908	2,113·669	63,138·66	546·627	1,270·598
1909	2,649·799	60,256·83	258·325	522·804
1910	2,203·052	70,954·38	665·552	753·363
1911	2,476·558	62,169·66	496·850	680·130
1912				
	15,674·831	459,249·52	2,366·470	4,216·482

In view, however, of the fact that other material has been treated in the Company's works in addition to the nickel-copper mattes from Copper Cliff, Ontario, it is impossible to state what proportion of the above recoveries was from Canadian sources, although it is, of course, safe to assume that part of these metals has been derived from the Sudbury District mattes.

An attempt has been made in the last few years to work the placer deposits of the Tulameen district of British Columbia, with a view to the recovery of platinum. In former times platinum was not recognized by the miners and in many cases was discarded as worthless. Several companies have been formed recently to operate in this district.

Annual Production of Platinum.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1887	5,600	1894	950	1901	457
1888	6,000	1895	3,800	1902	46,502
1889	3,500	1896	750	1903	33,345
1890	4,500	1897	1,900	1904	10,872
1891	10,000	1898	1,500	1905	500
1892	3,509	1899	825	1906	*
1893	1,800	1900	Nil.	1907-1912	**

* See under Palladium.
** See explanation in text.

Annual Production of Palladium.

	Ozs.	Value.
1902 Palladium	4,411	$86,014
1903 "	3,177	61,952
1904 "	952	18,564
1905 Metals of the platinum group	1,562	28,116
1906 " "	314	5,652
1907-1912	*	

* See explanation in text.

Imports of Platinum.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1883	113	1893	14,082	1903	21,251
1884	576	1894	7,151	1904	28,112
1885	792	1895	3,937	1905	61,719
1886	1,154	1896	6,185	1906	54,494
1887	1,422	1897	9,031	1907 (9 mos.)	113,485
1888	13,475	1898	9,781	1908	60,390
1889	3,167	1899	9,671	1909	45,534
1890	5,215	1900	57,910	1910	84,435
1891	4,055	1901	20,263	1911	137 241
1892	1,952	1902	19,357	1912*	191,370

* Platinum wire and platinum in bars, strips, sheets or plates; platinum retorts, pans, condensers, tubing and pipe, imported by manufacturers of sulphuric acid for use in their works; crucibles. Duty free.

TIN.

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important, perhaps, being the discovery of cassiterite, near New Ross, Lunenburg county, Nova Scotia. This occurrence has not yet been found of economic value. It has been visited by several officers of the Geological Survey, and reports upon it may be found in the Summary Report of the Geological Survey Branch of the Department of Mines, for 1907, pages 77 and 80 to 83, and in the report for 1908, page 154.

In further reference to the New Ross occurrences, Mr. Faribault, in his summary report for 1910, states that: 'At New Ross, Lunenburg county, some distance east of the district surveyed last summer, two important veins, one bearing manganese and the other tin and copper, were opened last summer.

'A tin-bearing vein, also recently discovered by Ernest Turner, at Mill Road, four miles north of New Ross, has been prospected under the management of A. L. McCallum. It has been proved to a depth of 20 feet, and for a length of 250 feet, while the float has been traced half a mile towards the north. The vein is 24 inches wide, mostly made up of quartz, merging with granite at the sides, and carries at the middle a streak of rich ore, from 3 to 5 inches wide. Several assays of the ore made by Mr. McCallum have given from 10 to 30 per cent tin, and 8 per cent copper, present in the form of cassiterite and chalcopyrite, with association of tungsten-bearing zinc minerals.'

In the Summary Report of the Geological Survey of Canada for 1911, page 13, will be found a note referring to the occurrence of tin associated with tungsten, on the southwest branch of the Miramichi river, New Brunswick.

The imports of tin and manufactures thereof into Canada are shown in the following table:—

Imports of Tin and Tinware.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	281,880	1891	1,206,918	1902	2,293,958
1881	413,924	1892	1,594,205	1903	2,712,186
1882	790,285	1893	1,242,994	1904	2,389,557
1883	1,274,150	1894	1,310,389	1905	2,791,757
1884	1,018,493	1895	973,397	1906	3,336,948
1885	1,060,883	1896	1,237,684	1907 (9 mos.)	2,719,813
1886	1,117,368	1897	1,274,108	1908	4,059,281
1887	1,187,312	1898	1,550,851	1909	2,985,361
1888	1,164,273	1899	1,372,813	1810	3,822,443
1889	1,243,794	1900	2,418,455	1911	4,647,784
1890	1,289,756	1901	2,339,109	1912	5,420,175

		Duty	Lbs.	$
1912	Tin crystals	Free.		3,626
	Tin in blocks, pig, and bars	"	4,174,000	1,706,678
	Tin plates and sheets	"	91,603,000	3,045,618
	Tin foil	"	1,470,423	168,315
	Tinware, plain, japanned or lithographed, and all manufactures of tin, N.E.S	25%		495,938
	Tin strip waste	Free.		
	Total			5,420,175

TUNGSTEN.

Scheelite was discovered in Halifax county, Nova Scotia, in 1908. Mr. Faribault, of the Geological Survey, visited this deposit again in 1909, and a preliminary report thereon will be found in the Summary Report of the Geological Survey for 1909, pages 228 to 234. During 1910 these deposits were developed by the Scheelite Mines, Limited, who have obtained very satisfactory results.

During 1911, the Scheelite Mines, Limited, continued development and prospecting work and operated their mill, making a shipment of 14 tons of tungsten concentrates—the first shipment from Nova Scotia—carrying 72 per cent tungstic acid.

In the Summary Report for 1910, Mr. Faribault refers to a discovery in Queens county, as follows:—

'A new discovery of tungsten ore in the form of scheelite has been made by A. N. Prest, at Middlefield, Queens county, near the Fifteen Mile Brook gold mine, and prospecting was started last fall in order to trace the float to the parent vein.'

The occurrence of wolframite has also been noted in association with molybdenite, by Dr. Walker, in New Brunswick, near the confluence of Burnt Hill brook and the southwest Miramichi. The property was tested by Mr. Freeze, of Doaktown, New Brunswick, and Mr. Matthew Lodge, of Moncton, who formed the Acadia Tungsten Mines Company. This Company has done a little development.